

# FLIGHT

&  
The AIRCRAFT  
ENGINEER.

First Aero Weekly in the World.  
Founder and Editor: STANLEY SPOONER.

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport.  
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## Flight

and The Aircraft Engineer.

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## EDITORIAL COMMENT.

"Newspapers are an essential part of our war organisation."

(Sir Auckland Geddes, Minister of National Service.)



THE most circumstantial stories of weaknesses in the constitution and administration of the Women's Royal Air Force which continually reach us have forced us to the conclusion that there is something very wrong indeed with the whole organisation. It will be within the recollection of those of

our readers who have followed the course of events in connection with this branch of women's war activity that recently a complete change was made in the command of the Force, and, from all we hear, not before it was wanted. But even now it seems to us that there is still a great deal to be done to place the organisation on a satisfactory basis. True, the new Commandant has not had much time to effect reforms, but it does not appear that it is so much a question of changing the command as of a complete reorganisation of administrative control that is required if the Force is really to

What is  
Wrong  
with the  
W.R.A.F.?

be taken seriously as a part of our war effort and if the right class of women is to be attracted to its ranks.

It has been obvious from the veiled references to trouble that have appeared in the Press from time to time that all is not well with the Force. There is, first of all, the question of the supply of suitable officers. Some weeks ago the administration of the Force notified through the Press that large numbers of women were required to fill the commissioned ranks. Naturally, the service being superficially attractive, a great many applications were received for admission. The candidates appear to have been called before a selection board, or boards, and those considered suitable were drafted to a training school at Eltham to undergo a probationary period of instruction. Now, on the paper notifying the appointment it was expressly stated that this period would be one of three weeks, which might be extended, but after a course occupying but ten days the probationers were required to sit for an examination, which it is true was elementary in its simplicity. None of the questions set were such as could not have been answered by any woman or girl of average intelligence who had paid proper attention to the course of instruction. The point is, however, that the course occupied a little less than half the time the candidates had been notified was considered the *minimum* period necessary. Will it be believed that of 170 or thereabouts who sat for this "examination" no more than thirty were selected for commissions? If our information is correct, and we have no reason to think that it is anything else than correct, these thirty were not selected because they had done the best papers, though nothing was disclosed to the unsuccessful as to how they stood in the list nor what were the reasons leading to their rejection, all of which still remain obscure.

We certainly have no desire to lay down the principle that those who are appointed to command and administer the Force should not have the say as to what type or what individual should be commissioned, nor shall we proceed to argue as to the merits of the rejection of the 140 or any one of them. Indeed, for the purposes of the argument we are willing to concede that not one of them would have made a suitable W.R.A.F. officer, though we have our own opinion as to that. But here comes the seriousness of the matter. Every one of the whole 170 had been before a selection board and passed as suitable for commissioned rank before going up for the three weeks'

course, which was abruptly terminated in ten days. Many of them had given up good employment in order to enter the W.R.A.F. Some had travelled long distances at their own expense to get to Eltham. One or two had come from as far north as the Orkneys. The experience of all was the same—a curt official intimation that they would not be commissioned and a single fare warrant back to their homes.

The school at Eltham was in charge of the Baroness T'Serclaes, and this lady has explained that the selection boards sent down hopelessly unsuitable candidates. We are very sorry to flatly contradict any lady, but we do assert that to our own personal and direct knowledge some at least of the 140 who were rejected were not only absolutely suitable in every way to become officers of the W.R.A.F. or any other similar organisation, but many were ideal candidates. Doubtless the explanation given is good in some cases, but we cannot for a moment accept it as applicable to the whole. Still, we shall not make it a main ground of complaint. What we do take exception to is the grossly unfair manner in which these candidates have been treated. Passed by selection boards—rightly or wrongly does not matter—they have been turned down at a moment's notice and practically been thrown into the street without adequate explanation. They have all of them been put to expense. Some have suffered severe hardship as a consequence, and not a word of apology, let alone compensation for proved loss, has been forthcoming. If these are the measures that are being taken to popularise the service among women of good class, then we think very little of the prospects. There is a good deal more that we might say with regard to these matters, but we prefer to restrict our remarks to the aspects of which we know absolutely and to refrain from comment upon others that, for the moment, are in the nature of allegation alone, but we intend to pursue investigation a good deal farther, and shall return to it in due season.

#### The Non-Commissioned Ranks.

It is not only in the direction of which we have spoken that matters are not at all as they should be. Since the R.A.F. became a separate service, the Air Ministry has assumed the responsibility for recruiting and administering the women's branch of the Force. As in the case of the commissioned ranks, it is an attractive service to girls and women who desire to "do their bit," and the conditions held out have undoubtedly attracted a large number of very good class women, many of them delicately nurtured ladies. The "Immobiles," who are employed in various services in their home towns are very well off, but unfortunately, this is most certainly not the case with the "Mobiles" who are called upon to serve anywhere. These women and girls are told that on joining they receive a free issue of uniform. Perhaps the Commandant or whoever is responsible for administration will say if it is true that not a single woman who has joined as a "member" of the W.R.A.F. has yet received an issue of uniform? That is our information. The general excuse given is, we understand, that it has not yet been decided whether the uniform is to be blue or khaki, though the latest news is that it is to be the latter. The position is that all these members are compelled to wear out their own civilian clothing, for which they receive nothing, or to buy their own uniforms, for which again they get nothing.

When these "Mobiles" are posted to stations they live either in hostels or in billets, very often two or more miles distant from their place of duty, to which there is generally no available means of transport. That would not be so bad, if the most elementary comforts were available. We have before us a letter from a "Mobile" to her mother, written from a Midland station at which she is in charge of the transport drivers. She says: "Things are rather terrible here. The food is awful—last night cold meat and cake for the evening meal, after which I had to march the girls two miles across muddy fields back to the hostel. There we have to sleep on the floor and hang our coats over the windows while we dress and undress. The girls are always in tears, and I have to tell them it is war time and this is war without the danger, but it is very difficult, and I don't know what is going to happen in the winter if things are not better. For Heaven's sake, send me a food parcel every week."

We like the cheerful pluck of this girl, who does her bit in trying to keep the rest cheerful in such circumstances, but we do not hesitate to say that it is a damnable thing that ladies—we know what we are talking about here—should be asked to work in the appalling conditions which the letter from which we have quoted conceals rather than discloses. There is certainly something very wrong with the administration of a Force in which these conditions can subsist at all, and we feel that in drawing attention to them we may be assisting to save a development which may eventuate into a scandal of the first magnitude unless drastic changes are made. Surely it is not asking too much that the women and girls who have come forward to assist in the relief of the man-power problem should be accommodated in circumstances of ordinary comfort and decency. We are not asking that they should be given luxuries, nor do they expect it, but there is a difference between that and the ordinary decencies of civilised life, which in too many cases they appear to be denied. Making every allowance for the exigencies of war and the necessity for the creation of organisation in a hurry, we say with a full sense of responsibility that there is something very gravely lacking in the administration of the W.R.A.F., and unless we hear news of immediate improvement, we shall, very reluctantly, be compelled to speak in even plainer terms than we have used on the present occasion.

#### Aircraft in Allenby's Victory.

What the mastery of the air means in warlike operations is well illustrated in the reports which have come to hand relating to General Allenby's splendid victory over the Turks in Palestine. Thanks to the overwhelming nature of the British aerial equipment in this theatre of war, the enemy seems to have been entirely without warning of the blow which was in preparation. During the battle itself, but one solitary aerial scout made its appearance over the lines, and it was promptly driven off! The Turk was thus compelled to give battle blindly, believing that the impending blow was destined to fall in a direction totally different from that designed by the British commander.

Unfortunately, it is not possible to establish the same sort of supremacy in the decisive theatre of the West, where the conditions are altogether different, though we may go far towards it if we continue to exert our maximum effort in the aeroplane factories



during the coming winter, when the actual battle shall have more or less died down under the influence of weather. It would be too much to hope that we can drive the enemy from the air to an extent which will absolutely blind him, but it is not aiming at too remote an objective for us to try. By aiming high we shall accomplish far more than as though we contented ourselves by limiting our object to the establishing of an actual superiority alone. The main lesson, however, of the Palestine battles is that in open fighting—in the battle of manœuvre—the victory must go, all other factors being equal, to the side which has established a definite and overwhelming aerial superiority. It is a thesis which was propounded long before the war by those who had appreciated truly the value of the aerial arm. It will possibly be remembered that it was very definitely laid down by the late General Grierson at the end of the Army manœuvres of 1913 that aerial observation would in future decide the fate of battles, and that the commander who had at his call a superior force of aircraft would be in the position of a certain ultimate victor. We have seen the truth of the proposition established more than once during the present war, but never so convincingly as in Palestine. The recent events on that front should form an excellent text for the student of war to develop the thesis.

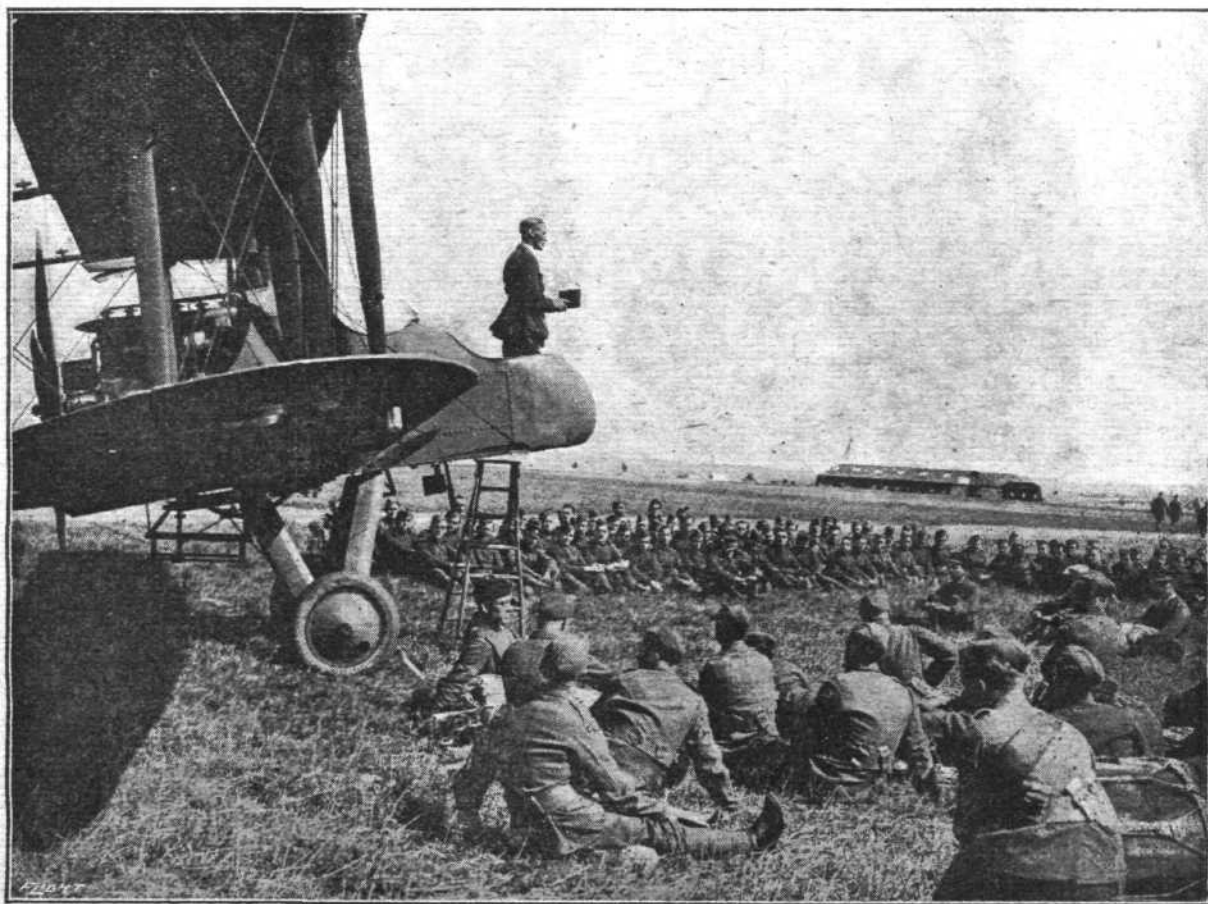
## The Chevrons Question.

**The Chevrons Question.** In the matter of the recent action of the Air Ministry in depriving officers and men of the R.A.F. of the active service chevrons gained overseas, we have received a letter from a serving officer, who points out that there are tens of thousands of Colonial soldiers who have never set foot in a theatre of war, and have never seen a shot fired in anger, who are wearing three and four chevrons. We are fully

aware of that, and we may as well say at once that we think very little of the good taste of officers and men who have seized upon a technical error in the regulations affecting the wearing of a distinctive sign to put up chevrons to which their service does not morally entitle them. There are many Australian and Canadian officers and men whose service has never taken them outside the safety of London who are wearing chevrons. They claim that they are serving "overseas," and that England is to them "a theatre of war." Technically, they are perhaps correct. Morally they are certainly wrong. The matter is one of conscience and good taste, and we are content to let it go at that.

Our correspondent goes on to point out that there are in addition tens of thousands of British troops who have been to France, but have never been near the firing line, but who wear chevrons. That may be true, but they have served in "a theatre of war," and it is probably no fault of their own that they have not been called upon to participate in the actual fighting. He further says, and here we agree with him, that the French know better how these things should be done. In the armies of France no soldier gets a special mark unless he has actually been in the fighting line. Finally, our correspondent says he approves of the decision of the Air Ministry, although he, who has helped to bomb the Huns and has actually been under fire, is not entitled to wear a chevron. As to the latter, we really think he is in error, and that a closer study of the regulations governing the wearing of the distinction would have entitled him to put it up, prior to the new ruling.

We recognise the abuses of the regulations which he points out. Not alone in the matter of chevrons do these abuses exist. Take the "silver badge" as another case in point. The wearer may have served



**A Sunday morning service in an aerodrome on the British Western front in France.—The Chaplain conducting Service from the nose of an aeroplane.**

Ministry of  
Information.

for four years in the actual firing line, or alternatively he may have qualified for it by a fortnight's chicken diet in a military hospital at home, that being the whole extent of his "military" service. But these are not the questions at issue. As we pointed out when we dealt with the subject in the article which has impelled our correspondent to write to us, the issue is one of good faith. The chevrons have been issued, and now the Air Ministry, for some reason which is not stated, has seen fit to deprive officers and men of the distinction in complete contradiction of its own ruling that no-one was to suffer in "pay, pension, decorations or rewards" as a consequence of transfer to the R.A.F. All other matters, including that of the degree of distinction conferred by the wearing of chevrons, are beside the point. That, as we understand it, is the view taken by the majority of the officers and men affected by the order.

### The Independent Air Force.

The military critic of the *Morning Post* has recently fallen foul of the Independent Air Force, and that rather badly. He inveighs bitterly against the policy which he alleges removes a considerable proportion of our fighting aircraft from its legitimate work of reconnaissance and fighting over the battle lines to the less effective task of "bombing the apple-women of Mannheim." We confess we do not know where Colonel Repington gets his facts. The probability is that this officer, having been on the retired list for a number of years, and knowing nothing of practical, modern war and its appliances, has found himself hard up for a topic which will not get him into trouble with Dora, and has let himself go about something he does not fully understand.

We have always taken the view that, while it was eminently desirable to carry the aerial war into Germany that part of our offensive arrangements would have to stand over until such time as the fullest needs of our armies on the various fronts had been supplied. That was the policy which was followed consistently by those in control of our air forces. But the moment the production of aircraft and of trained pilots had overtaken those needs and left over a surplus for other employment, it became opportune to carry the aerial offensive farther afield, and that is what has been and is being done. If we ourselves believed that the armies were being starved for pilots and machines which were detached for spectacular stunts over German towns, we should be among the first critics of the policy. We do not, however, believe that the position is anything of the sort. The *Morning Post* critic should know as well as anyone that a good maxim of war is that the best defence is in the offensive, and that the pudding is

proved in the eating is shown by the large-scale absorption of German material in the defence of the Rhine cities and in that of Berlin, which is in preparation against the threat of Allied air raids later on. This question of the detaining of German personnel and machines for home defence is one that goes deeply. We know that production in enemy countries is very severely handicapped by want of raw material. It cannot keep pace with the demands from the fighting fronts, let alone provide for home defence on an adequate scale. Thus, while we are using machines and pilots which are, so to say, supernumerary to battle-establishment, the Hun is driven to detain at home material which he would far rather dispose of at the front. In its turn, this must make easier the task of the Allied armies in the field.

Again, we do not send our machines to drop bombs blindly. Every raid is carried out against some point or points of military importance. Take Mannheim as an example. We do not endeavour to kill apple-women. What we are after are the Badische chemical works, which are the chief producers of poison-gas for use against our troops. Several times our squadrons have registered direct hits on these works and have caused much serious damage, with a corresponding effect on production. Surely it is worth while to employ our aircraft on direct military missions of this kind. Then we systematically raid the enemy's communication centres and cause endless delay and disorganisation to his transport of troops and material. Once more, this is surely worth while. We might go on quoting examples to show what is really achieved by the policy of the aerial offensive, but it is quite unnecessary, since every one who knows anything at all about it is convinced that it is right and proper policy. Lastly, Colonel Repington ventures the assertion that if the machines of the Independent Air Force had been employed with the armies during the recent offensive instead of being detached to bomb apple-women, the enemy's retreat would have become a rout. That is the easiest kind of statement to make, since it is impossible either to prove or disprove the proposition. He might equally have said that if we had had ten times the numbers of tanks we had, or if we had had five times as many infantry as we actually had at disposal, and if the Huns had broken and bolted we should have done much better. Fortunately, the Air Ministry is not likely to be turned from its intentions by the carping of a critic who has not been conspicuously successful in his summings-up of the progress and lessons of the war, so we take it the Independent Air Force will still continue to carry on in face of his disapproval.

### The Air Force in Palestine.

"THE value of mastery of the air could not be better exemplified than by the air work during these operations," wrote Mr. W. T. Massey from the Palestine headquarters on September 20th. "Only one enemy machine has been seen except that captured to-day. This was near Haifa, but it fled on seeing one of our machines. We took three to-day at Afuleh aerodrome with their mechanics and all their equipment. Over 11 tons of bombs were dropped yesterday, and 66,000 machine-gun rounds fired from a low altitude on the retreating enemy. The roads are covered with damaged material and dead. The road from Jenin to Afuleh, along which the Turks were walking unconsciously into our hands, was heavily bombed to-day with great accuracy, and large numbers of the dead and smashed vehicles were plainly visible on the road through the hills. At one spot bombed transport blocks the passage. To-day's 10 tons of bombs clearly played havoc."

Writing on September 22nd, Mr. Massey said:—

"British and Australian airmen chose a new field to-day. They attacked motor and other transport, which was trying to escape, along the road from Beisan, and dropped four tons of bombs on them, inflicting severe damage on men and material. Enemy machines were brought down or driven down near Deraa.

"In my wanderings I have seen the extraordinary success achieved by our airmen in these operations on the Tul Keram-Shechem road. Our airmen had broken up the transport columns, making it difficult for the men to move. The airmen returned and machine-gunned the troops who were endeavouring to hide.

"What had been accomplished in this neighbourhood was repeated on the Jisr-ed-Damieh road and elsewhere. The total casualties inflicted on the enemy by our airmen must reach a high figure."



# HONOURS

## Italian Honours for R.F.C.

It was announced in a Supplement to the *London Gazette* of September 12th that the following decorations have been conferred by the King of Italy for distinguished services rendered in the course of the campaign:—

### Silver Medal for Military Valour.

Temp. Capt. W. G. Barker, D.S.O., M.C., R.F.C.; Temp. Sec. Lieut. J. E. Bonniksen, R.F.C.; Temp. Capt. M. B. Frew, D.S.O., M.C., R.F.C.; Lieut. (Temp. Capt.) R. S. P. Bobby, Lancs. Fus. and R.F.C.; Capt. W. E. Molesworth, M.C., R. Muns. F. and R.F.C.

### Bronze Medal for Military Valour.

8639 Sgt. C. A. Barton, R.F.C.; 1429 Sgt. E. J. Elton, R.F.C.; 7228 1st Air-Mech. C. H. McCarthy, R.F.C.; 7061 Sgt. S. R. Marston, R.F.C.; 59404 Sgt. A. H. Muff, R.F.C.; 10219 1st Air-Mech. G. E. Richardson, R.F.C.; 113031 Sgt. J. Ryan, R.F.C.; 3116 Sgt. W. E. Smith, R.F.C.

## M.Ms. for R.A.F.

It was announced in a supplement to the *London Gazette* on September 13th that His Majesty the King has been graciously pleased to approve of the award of the Military Medal for bravery in the field to the undermentioned:—

12737 Sgt. H. G. Howard, R.A.F.; 402637 2nd Air-Mech. B. C. Rhodes, R.A.F., att'd. R.G.A.; 55961 2nd Air-Mech. H. C. Thomas, R.A.F.

## Honours for the R.A.F.

It was announced in a Supplement to the *London Gazette* issued on September 21st, that His Majesty the King has been graciously pleased to confer the undermentioned rewards on officers and other ranks of the Royal Air Force, in recognition of gallantry in flying operations against the enemy:—

### Awarded a Bar to the Distinguished Service Order.

Lieut. (T. Maj.) RAYMOND COLLISHAW, D.S.O., D.S.C., D.F.C. (late R.N.A.S.).—A brilliant squadron leader of exceptional daring, who has destroyed 51 enemy machines. Early one morning he, with another pilot, attacked an enemy aerodrome. Seeing three machines brought out of a burning hangar he dived five times, firing bursts at these from a very low altitude, and dropped bombs on the living quarters. He then saw an enemy aeroplane descending over the aerodrome; he attacked it and drove it down in flames. Later, when returning from a reconnaissance of the damaged hangars, he was attacked by three Albatross scouts, who pursued him to our lines, when he turned and attacked one, which fell out of control and crashed. (D.S.O. gazetted August 11th, 1917; D.S.C. gazetted July 20th, 1917; D.F.C. gazetted August 3rd, 1918.)

Lieut. (Hon. Capt.) BERNARD ARTHUR SMART, D.S.O. (Sea patrol).—Led his flight for 160 miles over sea and land, and destroyed by bombs an important enemy airship shed. This service was carried out under exceptionally difficult circumstances, requiring great skill, and was most creditably performed. (D.S.O. gazetted November 2nd, 1917.)

### Awarded the Distinguished Service Order.

Lieut. (Hon. Capt.) WILLIAM FORSTER DICKSON (Sea Patrol).—Displayed great skill and gallantry on the occasion of a long-distance bombing raid. He succeeded in dropping bombs on an airship station from a low altitude with destructive effect, and although subjected to severe fire from the enemy obtained valuable information.

Capt. (T. Maj.) DAVID EDMUND STODART, D.F.C.—Whilst commanding a flight of the Royal Air Force the whole of the flying officers had become incapacitated through sickness or wounds, and their duties were then performed by himself, in addition to his administrative work as commanding officer. During this period Maj. Stodart dropped 115 bombs on the enemy's position, exposed 326 negatives over enemy territory, and acted as observer for 163 rounds of our heavy artillery. In a period of 21 days this officer was 35 hours in the air, performing all the duties of an entire flight, a record which it would be difficult to surpass.

### Awarded a Second Bar to the Distinguished Flying Cross.

Lieut. (T. Capt.) ARTHUR HENRY COBBY, D.F.C. (Australian Flying Corps).—One evening this officer, in company with another machine, attacked five Pfaltz Scouts, destroying two; one fell in flames, and one broke up in the air. The officer who accompanied him brought down a third machine out of control. While engaged in this combat they were attacked from above by five triplanes. Displaying cool judgment and brilliant flying, Capt. Cobby evaded this attack and returned to our lines in safety, both machines being undamaged. A determined and most skilful leader, who has destroyed 21 hostile machines or balloons, accounting for three machines and two balloons in four days. (The announcement of award of first Bar is also contained in this Gazette; D.F. Cross was gazetted on August 3rd, 1918.)

### Awarded a Bar to the Distinguished Flying Cross.

Lieut. WILLIAM GORDON CLAXTON, D.F.C.—This officer is conspicuous for his courage in attack. Recently in one day he destroyed six enemy aeroplanes—four in the morning and two in the evening. In 13 days he accounted for 14 machines. His utter disregard of danger inspires all who serve with him. (D.F.C. gazetted August 3rd, 1918.)

Lieut. (T. Capt.) ARTHUR HENRY COBBY, D.F.C. (Australian Flying Corps).—An officer whose success as a leader is due not only to high courage and brilliant flying, but also to the clear judgment and presence of mind he invariably displays. His example is of great value to other pilots in his squadron. During recent operations he shot down five machines in eleven days, accounting for two in one day (D.F.C. gazetted August 3rd, 1918.)

Lieut. (T. Capt.) JAMES IRA THOMAS JONES, M.C., D.F.C., M.M.—A gallant officer who in the last three months has destroyed 21 enemy aeroplanes. On one occasion he attacked a Halberstadt two-seater, which was escorted by two scouts. On his approach the scouts deserted the two-seater, which he shot down in flames. He then pursued the two scouts, one of which he destroyed. (M.C. gazetted September 16th, 1918; D.F.C. gazetted August 3rd, 1918; M.M. gazetted August 10th, 1916.)

Lieut. (T. Capt.) EDGAR JAMES McCLEAHRY, D.F.C. (Australian Flying Corps).—In the short space of one month this officer has destroyed to enemy aeroplanes and balloons. He has organised and carried out numerous raids on the enemy, frequently at very low altitudes. Altogether he has destroyed 15 aeroplanes and four balloons. Early one morning he crossed our lines to attack a balloon which he had previously located. As soon as daylight allowed he dived and opened fire on the balloon, which was on the ground, descending to within 30 ft. of it. The balloon burst into flames. He then attacked some horse transport, dropping bombs and firing some 300 rounds at 1,500 ft. altitude. (The award of D.F.C. is also contained in this Gazette.)

Lieut. (T. Capt.) JOHN STANLEY FLEMING MORRISON, D.F.C.—A distinguished and zealous officer whose success in carrying out photographic reconnaissances is marked. He has also on several occasions led his flight on long-distance bombing raids, displaying sound leadership and powers of endurance. (D.F.C. gazetted June 3rd, 1918.)

Lieut. (T. Capt.) GEORGE EDWARD HENRY McELROY, M.C., D.F.C. (Royal Gar. Artillery).—In the recent battles on various army fronts this officer has carried out numerous patrols, and flying at low altitudes, has inflicted heavy casualties on massed enemy troops, transport, artillery teams, &c., both with

machine-gun fire and bombs. He has destroyed three enemy kite balloons and 43 machines, accounting for eight of the latter in eight consecutive days. His brilliant achievements, keenness, and dash have at all times set a fine example and inspired all who came in contact with him. (M.C. gazetted March 26th, 1918; first Bar April 22nd, 1918; second Bar July 26th, 1918; D.F.C. gazetted August 3rd, 1918.)

### Awarded the Distinguished Flying Cross.

Lieut. CHARLES TORR ANDERSON.—An exceptionally skilful and intelligent observer, who on numerous occasions has most successfully directed artillery fire on hostile batteries, transport and massed infantry. His reconnaissance reports also have been most valuable and accurate, and of the greatest assistance to our raiding parties. Recently in 24 hours this officer was in the air for over seven; during this time he directed fire on four hostile batteries, all of which were silenced, and three heavy explosions were caused. He also reported by zone call ten other batteries, good results being obtained on each position. In addition, he carried out two valuable reconnaissances of enemy wire entanglements at low altitudes.

Lieut. (Temp. Capt.) SYDNEY ANDERSON (Sea Patrol).—In an engagement between three of our machines and seven of the enemy this officer displayed, remarkable courage and determination. Wounded early in the fight and suffering great pain, he continued the action, and drove down one hostile aircraft, causing it to make a very bad landing.

Lieut. (Hon. Capt.) THOMAS COCHRANE ANGUS (Hon. Artillery Coy.).—A gallant and skilful officer, who has taken part in 11 long-distance night bombing raids. On one of these his machine alone, out of the five detailed, reached the objective. The weather conditions were most difficult; despite this, and in face of severe anti-aircraft fire, he successfully bombed his target.

Lieut. GORDON FRANK MASON APPS.—A bold and skilful airman who in recent operations has destroyed six enemy aeroplanes, accounting for two in one flight. He displays marked determination and devotion to duty.

Lieut. OWEN MORGAN BALDWIN.—A gallant and skilful pilot who has on many occasions attacked troops and transport at low altitudes. Recently he encountered 12 enemy aeroplanes, two of which he crashed. He has, in addition, accounted for five other machines showing at all times fearlessness and resource.

Capt. ARTHUR THOMAS BARKER (Sea Patrol).—Has led flights of seaplanes on long-distance reconnaissances, attacking hostile aircraft wherever found. He has set a fine example in gallantry and determination to all serving with him.

Lieut. JOHN ROSS BELL (Dorset Regt.).—This officer is an exceptionally gallant and determined pilot, who has taken part in 37 raids, five of which he has led. On a recent occasion, the formation of which he was leader was attacked by 12 aeroplanes. He fought his way to his objective and successfully bombed it. On the return journey continuous fighting took place, and three enemy aeroplanes were driven down.

Lieut. ROBERT STEVENSON BELL.—This officer, while carrying out observation service from a balloon, was subjected to heavy and continuous shell fire for over 2½ hours, his balloon being punctured in nine places; despite this he continued his observation. On several previous occasions he has displayed equal coolness and disregard of danger, carrying on his observation service in face of heavy hostile fire.

Lieut. (T. Capt.) WILLIAM WEDGWOOD BENN, D.S.O. (London Yeo.).—A gallant observer of exceptional ability. After setting out on a bombing raid, the Scout machines assigned to act as an escort became separated, and it then became necessary for the bombing planes to proceed on their task without support. Capt. Benn's machine took the lead, followed by three other bombers, and succeeded in dropping his bombs (direct hits) on an enemy aerodrome. On the return journey the bombing machines were attacked by several enemy scouts, which were eventually driven away. Recently, this officer organised and carried out a special flight by night over the enemy's lines, under most difficult circumstances, with conspicuous success. He has at all times set a splendid example of courage.

Capt. ERIC BOURNE COULTER BETTS, D.S.C. (Sea Patrol).—An observer officer of great skill who has carried out over 20 long-distance photographic reconnaissances during the past four months, and in conjunction with his pilot, has brought home about 1,000 photographs of enemy positions of inestimable value, in addition to destroying eight enemy machines.

Lieut. GEORGE HOLYOAKE BOX.—This officer has taken part in 18 long-distance night bombing raids and ten long-distance night reconnaissances, at all times showing exceptional keenness, untiring energy and devotion to duty. One night he carried out a very important reconnaissance lasting 3½ hours, bringing back most valuable information. Immediately on his return he proceeded on a bombing raid; having found his objective, he descended to a low altitude and successfully bombed the target. He was in the air that night six hours.

Lieut. ALBERT JAMES ERNEST BROOMFIELD.—This officer shows great determination and skill in carrying out night reconnaissances, frequently under adverse weather conditions and at very low altitudes. During last month he was engaged in eight most successful reconnaissances. On two consecutive nights when, owing to the darkness he was compelled to fly at about 500 ft. altitude, he located and bombed with success an important railway junction.

Lieut. COLIN PETER BROWN (Sea Patrol).—Was engaged in a bombing raid on an enemy seaplane base by night, and dropped his bombs from a height of 500 ft., causing considerable destruction. Shortly afterwards he bombed an enemy aerodrome in daylight, also from a height of 500 ft., and then descended to 300 ft. and destroyed an enemy machine. On arriving at his aerodrome 59 bullet-holes were found in his machine. He has since then destroyed two enemy aeroplanes. Lieut. Brown has been engaged in several other aerial fights, and has proved himself a gallant and resourceful flight leader.

Lieut. RICHARD CLAUDE CAIN.—By his skill and initiative as an observer this officer has on many occasions directed fire on enemy artillery, wagon lines and convoys, causing serious damage. His work has been most valuable, carried out at times under very difficult conditions. On a recent occasion he successfully bombed a bridge, obtaining a direct hit at a low altitude.

Lieut. (T. Capt.) JOHN FOSTER CHISHOLM, D.S.C. (Sea Patrol).—A gallant, and successful Flight Commander. He has led his formation in 25 raids in a period of 30 days, generally to a distance of 25 miles over the lines. On a recent occasion he encountered seven enemy aircraft whilst he was engaged in bombing a particularly dangerous enemy position. He destroyed one enemy machine, and his formation accounted for three more. All our machines returned safely.

Lieut. LEONARD ARTHUR CHRISTIAN (late R.N.A.S.).—Since joining his squadron this officer has taken part in 47 bomb raids, displaying at all times keenness and determination, and rendering his pilot most valuable support. He has accounted for four enemy aeroplanes, destroying two, and driving down two out of control.

Lieut. HENRY EDWARD CLARK (Sea Patrol).—An officer of exceptional skill and determination as observer and bomb-dropper. He has been engaged on 30 raids, and recently obtained direct hits on a great enemy war factory which caused immense explosions and fire therein.

Sec. Lieut. GEORGE BRENTON COWARD (Sea Patrol).—A very efficient pilot and able leader who has done most valuable service, displaying at all times the



greatest courage and devotion to duty. When attacking lock-gates and shipping in an enemy port he sunk a hostile destroyer, obtaining a direct hit on its stern.

Capt. BERNARD CHARLES HENRY CROSS (Sea Patrol).—Has set a splendid example to young pilots by his gallantry in going up in any weather when the necessity so demands. Capt. Cross has carried out a vast number of reconnaissance patrols in hostile waters, and has attacked submarines on many occasions.

Capt. CYRIL MARCONI CROWE, M.C.—This officer has been engaged on active operations over the lines for over twelve months, and has accounted for ten enemy aeroplanes. He is a most successful leader, distinguished for skill and bravery. On a recent occasion he, accompanied by two other machines, attacked an enemy formation consisting of four biplanes and one triplane. Having destroyed a biplane he engaged the triplane at close range and destroyed that also.

Lieut. (T./Capt.) PHILIP HILDERSLEY CUMMINGS (Seaforth Highlanders).—This officer has carried out over 100 night bombing raids, often under most adverse weather conditions and in face of heavy hostile fire. On three consecutive nights he bombed two enemy aerodromes, obtaining direct hits at 1,000 ft. altitude. On another raid, owing to engine trouble, he was unable to climb over 2,000 ft.; he nevertheless reached his objective. On all occasions this officer displays marked determination and courage.

Lieut. DOUGLAS DARBY (Scottish Rifles).—This officer has taken part in 24 long-distance night raids, displaying at all times remarkable determination and bravery. During recent operations he played a very prominent part in two successful night raids. In one he descended to between 500 and 150 ft. altitude, getting well over the target to ensure his bombs being effective; in the other he was one of the first to find his objective, and, descending to 500 ft. altitude, he dropped his bombs.

Lieut. (T./Capt.) FRANCIS JAMES DAVIES.—During recent operations this officer has accounted for five enemy aeroplanes. Bold in attack and skilful in manoeuvre, he is a valuable airman who sets a fine example to all.

Lieut. (T./Capt.) RICHARD JEFFREY DAWES.—During recent operations this officer has destroyed six enemy aeroplanes. A very gallant and courageous officer.

Lieut. SAMUEL DAWSON (Sea Patrol).—Was engaged in a long-distance bombing raid on an enemy aircraft station under very difficult circumstances, and carried out a successful attack from a low height in the face of severe enemy fire.

Lieut. (Hon./Capt.) HIPPOLYTE FERDINAND DELARUE (Sea Patrol).—This officer, in a Short seaplane, accompanied by another, formed escort to machines carrying out a long-distance bombing raid. When nearing the objective both machines were attacked by a fast enemy scout, and the companion plane was forced to alight. Capt. Delarue at once followed it down, picked up pilot and observer, and returned with the two additional passengers. A brave and meritorious action, for the risk he ran was great in such close proximity to the enemy, it being extremely doubtful if his machine would rise from the water with four on board.

Sec. Lieut. EDWARD ALPHONSE DEW.—A keen and dashing officer, who has taken part in numerous bombing raids and photographic reconnaissances. Whilst on a bombing raid his machine, flying in rear of the formation, was attacked by five enemy scouts. Two of these he engaged at close range; at the outset he was dangerously wounded in the thigh. Despite this he continued firing his guns until he fainted from loss of blood. He succeeded in bringing down one of the scouts in flames.

Lieut. (Hon./Capt.) EVAN DICKSON, D.S.C. (late R.N.A.S.).—Since April 17th, 1918, this officer has led 84 successful bombing raids. His leadership has been conspicuous for remarkable bravery, skill, and determination. On one raid directed against a town in occupation by the enemy he obtained seven direct hits on the railway station and four on a dump outside. Thrice on a prior date he led his flight to attack enemy billets and horse lines, descending to low altitudes and engaging enemy troops on the ground.

Capt. GRAHAME DONALD (Sea Patrol).—An exceedingly keen and capable pilot, who has proved himself subsequently to be a skilful Flight Commander. Has carried out valuable escort and reconnaissance patrols, and has brought down at least two enemy aircraft.

Lieut. CEDRIC GEORGE EDWARDS.—The fearlessness and disregard of danger displayed by this officer in attacking enemy troops, &c., at low altitudes is most marked, and worthy of the highest praise. On one occasion in an attack on an aerodrome, to enable him to fire on the hangars he descended so low that the wheels of his machine touched the ground. He has in air combats destroyed three hostile aircraft.

Capt. ALBERT JAMES ENSTONE, D.S.C. (Sea Patrol).—Has been engaged for 18 months on active service flying (ten months as Flight Leader). Has destroyed 12 hostile machines and brought down six more out of control. During the past month Capt. Enstone attacked an enemy gun, which was firing on one of our crashed machines, and succeeded in blowing up the ammunition dump alongside the gun, causing a great explosion, with flames reaching to a height of nearly 300 ft.

Capt. STANLEY JOHN FETHERSTON (Sea Patrol).—Has been continuously employed on long reconnaissances for 14 months, during which period he has been in action many times with hostile aircraft. Capt. Fetherston has always performed his arduous duties with courage and determination. He assisted a few months back in destroying an enemy submarine.

Lieut. (T./Capt.) GORDON FOX-RULE.—Whilst on a bombing raid this officer dived to 100 ft. and obtained a direct hit on a bridge, completely destroying it. Seeing a body of the enemy on the bank of the river he attacked them, causing them to disperse in disorder. He was then attacked by five biplanes; these he drove off, though his observer had been hit twice, and he landed safely at a French aerodrome. In all, he has taken part in 30 bomb raids and to photographic reconnaissances, invariably displaying a marked offensive spirit.

Lieut. (T./Capt.) REGINALD GEORGE DAVID FRANCIS (Australian Flying Corps).—During two consecutive days this officer carried out most valuable work in ranging on batteries. Flying 8½ hours the first day and four hours the second, he successfully ranged our artillery on seven hostile batteries. In co-operating with our artillery he shows conspicuous bravery and marked ability.

Capt. JOHN OSBORN GALPIN, D.S.C. (Sea Patrol).—A skilful and gallant pilot, who has performed valuable services in attacks on enemy aircraft.

Capt. JAMES LINDSAY GORDON (Sea Patrol).—A pilot of great experience, initiative and skill. Has led formations over the seas and attacked with success enemy aircraft in their own area. Capt. Gordon has been instrumental in saving life in disabled seaplanes on several occasions, and whenever any arduous duty has to be done, he is always to be found to carry it out.

Lieut. JOHN SHARPE GRIFFITH.—During the last few months this officer has destroyed three enemy aeroplanes and assisted in bringing down a fourth; he has, in addition, driven down two balloons and shot down two machines out of control. Whilst leading his patrol at 11,000 ft. altitude he observed three enemy aeroplanes at 2,000 ft.; he immediately dived and led his patrol to the attack, destroying two of the machines, one of which he accounted for himself. A gallant and determined officer.

Lieut. WILLIAM GROSSART.—During the last two and a half months this officer has carried out 27 successful bombing raids and 25 special photographic reconnaissances, his services on the latter duty being exceptionally valuable. This officer possesses a fine spirit of determination; neither strong opposition nor adverse weather conditions deters him from achieving his object.

Lieut. ALFRED JOHN HAINES.—During the past three months this very gallant

pilot has destroyed five enemy machines and earlier in the year he crashed another. He was killed in action on August 10th, 1918.

Lieut. (T./Capt.) GEORGE HENRY HARRISON (Middlesex Regt.).—A gallant officer of great initiative and resource, who has carried out seven successful night reconnaissances and 16 night bombing raids during recent operations. One night when on reconnaissance he remained in the air two and a half hours, despite the fact that his engine was cut out thrice and his machine badly shot about.

Lieut. THOMAS SINCLAIR HARRISON.—When on wireless interception duty this officer engaged three enemy machines, shooting down one in flames. He was then attacked by three scouts and a two-seater; the latter he shot down. During the last few weeks he has accounted for three hostile aeroplanes and a balloon, displaying vigour and gallantry in attack.

Lieut. (Hon./Capt.) EDWIN TUFNELL HAYNE, D.S.C. (late R.N.A.S.).—During the recent enemy offensive this officer carried out 48 special missions. Flying at extremely low altitudes he has inflicted heavy casualties on massed troops and transport. In addition he has accounted for 10 enemy machines, destroying three and driving down seven out of control; in these encounters he has never hesitated to engage the enemy, however superior in numbers. On one occasion he observed hostile aeroplanes harassing three Dolphins; he attacked three of the enemy, driving one down in flames.

Capt. RICHARD HILTON M.C. (R.G.A.).—An officer who shows remarkable skill and courage in co-operating with our artillery, and in carrying out photographic reconnaissances. He also proved himself a very gallant leader on a recent raid, when he led two low patrols over the lines, attacking with machine-gun fire and heavily bombing enemy reserves. The machine in which he was flying was rendered useless for further service, so intensive was the hostile aircraft fire.

Capt. (T./Major) THOMAS HINSHELWOOD (Sea Patrol).—A most efficient squadron commander. With great ability and judgment he has led his squadron on photographic and long-distance bombing raids, obtaining valuable information. The high standard of efficiency attained by his squadron is largely due to his personal influence.

Lieut. (T./Capt.) JEFFREY BATTERS HOME-HAY, M.C. (A. & S. Highrs.).—This officer displayed admirable coolness and resource while leading a raid on an enemy railway station. His formation was heavily attacked by seven aeroplanes, but keeping it well in hand, he fought his way to his objectives; proceeding well over the station, he successfully bombed it. In the course of the severe fighting two hostile machines were shot down out of control, one of which he himself brought down. He has taken part in eight other raids, and his consistent gallantry is a valuable asset in maintaining the moral of his new squadron.

Lieut. (T./Capt.) CEDRIC ERNEST HOWELL.—On a recent occasion this officer, leading his patrol of three machines, attacked nine enemy aeroplanes, destroying six and driving down one out of control; he himself accounted for two of these. On a former occasion he destroyed three enemy aeroplanes in one flight. He is a fine fighting officer, skilful and determined.

Lieut. PAUL THAYER IACCACI.—A bold and successful fighter, who on four offensive patrols has accounted for six enemy aeroplanes; two he shot down himself, and four were destroyed with the assistance of his observer. In these several encounters the formation in which Lieut. Iaccaci was serving was engaged against heavy odds.

Lieut. (Hon./Capt.) WILLIAM DOUGLAS JACKSON (Sea Patrol).—Led his flight in a long-distance bombing raid on an enemy aircraft station under very difficult circumstances, and carried out a successful attack from a low height, in the face of severe enemy fire.

Lieut. JOHN KINGSLEY JEAKES (Sea Patrol).—A gallant officer who has taken part in numerous long-distance reconnaissance and bombing raids. While on one of the latter he destroyed an enemy seaplane on the water, obtaining two direct hits.

Lieut. (T./Capt.) NORMAN CYRIL JONES (R.F.A., T.F.).—A gallant and skilful patrol leader who has proved successful on many occasions against numerically superior enemy formations. Capt. Jones had personally destroyed six enemy machines this year.

Lieut. GORDON SHEPPARD JONES-EVANS (Australian F.C.).—On returning from a raid on enemy rolling stock this officer observed an enemy two-seater machine below him; engaging it, the machine dived vertically and crashed. He was then attacked by a second two-seater; into this he fired a very short burst and it also spun down and crashed. In this engagement Lieut. Jones-Evans was wounded, but though faint from loss of blood, he succeeded in reaching our lines, where he crashed. In the last few weeks he has destroyed three two-seaters and brought down one balloon in flames.

Lieut. (Hon./Capt.) WILLIAM LANCELOT JORDAN, D.S.C. (late R.N.A.S.).—A brilliant and most gallant leader who has already been awarded the D.S.C. and Bar for distinguished services and devotion to duty. He has led numerous offensive patrols into action, displaying at all times marked ability, determination and dash. He is an ideal Squadron Commander who has personally accounted for 25 enemy machines.

Lieut. SOLOMON CLIFFORD JOSEPH (Sea Patrol).—A gallant pilot who has accounted for eight enemy aircraft within the past four months. On many occasions the enemy were numerically superior to Lieut. Joseph's patrol, but this did not prevent his attaining success.

Lieut. (T./Capt.) NOEL KEEBLE, D.S.C. (Sea Patrol).—This officer (with an observer) has obtained 1,000 invaluable photographs of enemy positions behind the lines, and has brought home extremely important new information during this period. He has destroyed eight enemy machines, including one biplane during the past month. Capt. Keeble is a most capable and gallant Flight Commander.

Lieut. (T./Capt.) DENNIS LATIMER, M.C.—When leading an offensive patrol this officer displayed great skill and bravery. Having shot down a scout in flames, he immediately engaged a second, which he destroyed after a short combat. In addition he has accounted for four other machines.

Lieut. (T./Capt.) FREDERICK ANDREW LAUGHLIN.—While bombing an important railway station the formation, of which this officer was leader, was attacked by about 20 enemy scouts. In the engagement that ensued, two enemy aeroplanes were destroyed and a third driven down out of control. These results were largely due to his excellent leadership. He has taken part in 40 bomb raids, the objectives of many being far over the enemy lines. His knowledge of navigation and skill as a leader have been invaluable in enabling the formation to reach the objectives.

Lieut. (T./Capt.) GWILYN HUGH LEWIS (Northamptonshire Regt.).—It is largely due to this officer's ability and judgment as a flight leader that many enemy machines have been destroyed with very few casualties in his formation. He is bold in attack, and has personally accounted for eight enemy aircraft, displaying marked disregard of personal danger.

Capt. (T./Major) GERALD EDWARD LIVOCK (Sea Patrol).—Has rendered valuable services on numerous occasions on reconnaissance patrols in enemy waters, in attacks on hostile seaplanes, and in connection with anti-submarine patrol work.

Lieut. (T./Capt.) EDGAR JAMES MCCLAUGHRAY (Australian F.C.).—Early one morning this officer left the ground, and, meeting an enemy two-seater 10 miles over the lines, he engaged and destroyed it. He was immediately attacked by five scouts; these he out-manoeuvred, destroying one and driving the remainder down. He is a determined and successful scout leader, who in recent operations has accounted for nine enemy machines, in addition to three others and one balloon when serving with another squadron.



Lieut. CHRISTOPHER McEVoy.—A gallant pilot who has destroyed six enemy machines in a few months. He displays great determination in his attacks in high or low flying, and in bombing attacks over the enemy's lines.

Lieut. CLIFFORD McEWEN, M.C. (Can. Inf., Res. Bn.).—A skilful and fearless officer who in three weeks destroyed five enemy aeroplanes. (Notification of this award appeared in *Gazette* July 2nd, 1918.)

Lieut. (T. Capt.) EVANS ALEXANDER McKAY, M.C.—This officer led a raid on an important railway station: during this operation, which was most successful, 24 hostile aircraft attacked his formation. In the engagement he displayed fine leadership and skill. Three of the hostile machines were destroyed and one driven down. He is an exceptionally good formation leader, and his determination to reach his objective is only equalled by his coolness and courage when attacked.

Lieut. (T. Capt.) DONALD RODERICK MacLAREN, M.C.—Accompanied by two other pilots, this officer attacked four enemy aeroplanes; all of these were destroyed; he himself fought two down to within 200 ft. of the ground, destroying both. The two pilots who were with him each accounted for one of the remaining two. It was a well-conceived manoeuvre ably carried out, reflecting credit on all concerned. This officer has in four and a-half months accounted for 37 hostile aircraft and six balloons, displaying great resolution and exceptional tactical ability.

Lieut. ROY MANZER.—While carrying out a solitary patrol he observed a two-seater below him; diving on it he opened fire, and followed it down to 1,000 ft., caused it to land outside the aerodrome. During his return to our lines he saw a hostile kite balloon; attacking it as it was being hauled down he closed to point blank range at 300 ft. altitude; on reaching the ground, the balloon burst into flames. In addition to the above, this officer has accounted for seven enemy machines, four of which were destroyed and three driven down out of control.

Lieut. (Hon. Capt.) HAROLD THOMAS MELLINGS, D.S.C. (Sea Patrol).—A very gallant officer who, on a recent patrol, attacked and caused to crash an enemy two-seater. Later, on the same patrol, he was attacked by four Fokkers, one of which he shot down at a range of 10 yards; this machine was seen to crash. A second was driven down smoking. Since he was awarded a Bar to the Distinguished Service Cross Capt. Mellings has, in addition to the above, accounted for 11 enemy machines—seven destroyed, and four driven down out of control.

Lieut. (T. Capt.) JAMES MITCHELL, M.C.—During the last few months this officer has destroyed five enemy aeroplanes, displaying at all times gallantry and devotion to duty. (Notification of this award appeared in *Gazette* July 2nd, 1918.)

Lieut. MARTINUS THEUNIS STEYN PAPENFUS.—This officer displayed excellent judgment in a recent raid. Keeping his formation well together, and descending to low altitude, he led them well over an enemy factory and so enabled them to use their bombs most effectively. The success of this operation was very largely due to his fine leadership. In addition, he has taken part in 18 raids as deputy leader of the formation, invariably showing the greatest keenness and devotion to duty.

Lieut. JOSHUA PARKE.—This officer has taken part in 40 long-distance day bomb raids and photographic reconnaissances. His work as an observer has been consistently good, and he displays great gallantry and determination, notably in a bombing raid when he was observer to the leader of our second formation.

Lieut. (T. Capt.) HERBERT ANDREW PATEY (Sea Patrol).—Whilst leading his flight on an offensive patrol eight enemy machines were encountered. Capt. Patey was cut off from his patrol by two of the enemy who got on his tail, and continued in that position until within 2,000 ft. of the ground, at which point his machine was hit in the petrol tank. Notwithstanding his serious handicap, he turned four times on his pursuers, destroying one, and driving the remainder away. On previous occasions this officer has destroyed two enemy machines and brought down two more out of control, and, in company with other pilots, he has assisted in destroying or bringing down out of control five additional enemy aircraft.

Sec. Lieut. WILLIAM RUSSELL PATEY (Royal Irish Rifles).—For consistent good work, gallantry, and skill as an observer on long-distance bombing raids and photographic reconnaissances. During a raid three months ago, his machine was heavily engaged by hostile aircraft. By very judicious management he remained master of the situation, and eventually destroyed one of the enemy machines. During the past month he has again displayed notable qualities of airmanship whilst encountering large numbers of enemy aircraft. Lieut. Patey is always prepared to carry out any kind of operation entrusted to him, and the spirit he has shown when attacked has been of inestimable value to the squadron.

Sec. Lieut. DESMOND PHILIP POGSON.—In a recent long-distance bombing raid his petrol tank received a shot immediately after crossing the line, but he continued on his journey and bombed the distant objective. On the return journey very fierce fighting occurred, during which both leaders and deputy-leaders of our formations were shot down, and the remaining machines lost touch with each other. At this critical moment Sec. Lieut. Pogson ordered his observer to tie his handkerchief to the gun-mounting to indicate that his was the leader's machine. He then circled over the area three times and picked up five of our machines, and in face of very hostile opposition got them into formation and brought them all safely home. The prompt action of this officer was highly meritorious, and undoubtedly saved the remaining machines, which could not have coped with the greatly superior formations of the enemy.

Lieut. (T. Capt.) WALTER GEORGE PRESTON.—This officer has taken part in 70 bombing raids, and has rendered most valuable service on reconnaissance duty by night. One night he carried out three most successful bombing raids on hostile rest billets, dropping his bombs and engaging the enemy troops with great effect. He sets an excellent example of skill and gallantry.

Sec. Lieut. HARTLY PULLAN.—This officer has taken part in numerous long-distance bombing raids and reconnaissances. His work has been consistently good. On a recent occasion when on photographic reconnaissance he was attacked by three scouts; he shot down one and the other two dived away. A few minutes later he was again attacked, this time by five triplanes, one of which he shot down out of control.

Lieut. (T. Capt.) JOHN STEELE RALSTON, M.C. (Scottish Rifles, T.F.).—An intrepid patrol leader who in recent operations has accounted for three enemy machines and three kite balloons. Recently while on patrol he advanced to attack a kite balloon; on his approach the balloon party began to haul it down, but forcing home his attack, he shot the balloon down in flames. In the engagement this officer was seriously wounded. Suffering great pain, he flew back to our lines and tried to land, but fainted and crashed.

Sec. Lieut. CYRIL LANCELOT RAYMENT.—This officer has taken part in 35 successful operations, and his work throughout has been distinguished by clearness, accuracy of observation and disregard of danger, notably on one occasion when he was observer to the leader of our first formation, which was vigorously attacked by four hostile machines. In spite of this the formation was led over the target, which was effectively bombed. Subsequently the formation was attacked by five hostile machines, but owing to skilful leadership the fire of our observers was so well controlled and directed that the enemy were kept at a distance and the formation returned in safety.

Lieut. (Hon. Capt.) ROBERT REDFERN (Sea Patrol).—A zealous and very able observer, who has carried out extremely valuable photographic reconnaissances on enemy country and bases. He has also taken part in many long-distance bombing raids on important enemy towns.

Lieut. NORMAN ROBERTS.—This officer has destroyed three enemy machines and driven down two others out of control. He has also distinguished himself in attacking troops at low altitudes, and has carried out valuable reconnaissance service. Detailed to make a reconnaissance of an important area, he realised, on crossing our lines, that the wind was almost at hurricane strength, and that in face of such a wind his return journey would only be accomplished with extreme difficulty. However, knowing the urgency of his mission, he completed his reconnaissance, penetrating 12 miles behind the enemy lines. On the return journey, owing to the strength of the gale, he was forced to descend to a very low altitude, and was subjected to heavy anti-aircraft and machine-gun fire, which badly damaged his machine.

Lieut. INDRA LAL ROY.—A very gallant and determined officer, who in 13 days accounted for nine enemy machines. In these several engagements he has displayed remarkable skill and daring, on more than one occasion accounting for two machines in one patrol.

Lieut. (T. Capt.) THOMAS SYDNEY SHARPE (Glouc. Regt.).—A gallant officer who has always led his patrol with marked skill and judgment. On one occasion he chased down an Albatross scout and caused it to crash. He afterwards attacked five enemy machines, destroying two. On the following day, encountering four Albatross scouts, he engaged one, which crashed. Proceeding on his patrol, he met a formation of enemy scouts; he chased one and destroyed it.

Lieut. RICHARD GEORGE [SHAW (Sea Patrol).—In company with another machine he recently attacked seven enemy seaplanes and destroyed one of them. Lieut. Shaw has shown exceptional ability as a flight leader. He has carried out successfully 21 bombing raids, 51 anti-submarine patrols, and has descended to very low altitudes to attack hostile submarines, destroyers and trawlers, scoring at least two direct hits. This officer displays great determination and keenness in his work.

Lieut. (T. Capt.) BENJAMIN JAMES SILLY, M.C.—For exceptional skill and gallantry on long-distance raids, in 47 of which he has been engaged, and has been the leader on 22 occasions. Within the past month he led a formation of bombers which accomplished their object notwithstanding that the enemy scouts were encountered almost from the start, and at the destination they numbered 40 machines. Capt. Silly's formation destroyed four enemy aircraft, and returned without losing a single machine.

Lieut. FRANK WOOLLEY SMITH (Notts and Derby. Regt., T.F.).—This officer has carried out most valuable work in observing for our artillery from kite balloons. On one occasion his balloon was brought down in flames; his parachute did not open properly, and he fell very rapidly; fortunately, a tree broke his fall and saved him from what seemed certain death. Although badly shaken he volunteered at once to ascend in another balloon. On a later date, when engaged in registration for one of our batteries, his balloon was burnt; after parachuting down, he at once ascended in another balloon and completed his task. The courage and coolness shown by him under these circumstances deserves the highest praise.

Lieut. (T. Capt.) WILLIAM ERNEST STATON, M.C.—This officer has already been awarded the Military Cross for gallantry and devotion to duty. Since this award he has accounted for 11 enemy aeroplanes—nine destroyed and two shot down out of control. He has proved himself a most efficient flight commander and an enterprising leader, setting a very fine example to his squadron.

Lieut. WILLIAM SAMUEL STEPHENSON, M.C.—This officer has shown conspicuous gallantry and skill in attacking enemy troops and transports from low altitudes, causing heavy casualties. His reports, also, have contained valuable and accurate information. He has further proved himself a keen antagonist in the air, having during recent operations, accounted for six enemy aeroplanes.

Lieut. EARLE RICHARD STEWART.—For gallantry and skill as an observer on long-distance bombing raids. During a raid a few months back he was in the deputy leader's machine (which usually has to bear the brunt of an attack), and in the course of repelling vigorous enemy attacks he had a breakage in his gun, with the result that he could only fire single shots. In these circumstances he would have been justified in causing his pilot to close up under the remainder of the formation, but with great coolness and sound judgment he maintained his place, and thus avoided the risk of impairing the squadron's defensive efficiency. By his action he rendered the most valuable assistance to his formation in holding off the enemy, and by the time the enemy had been dispersed he had fired 200 rounds by single shots with excellent effect. Lieut. Stewart has rendered further distinguished services during the past month, displaying very great ability and absolute fearlessness.

Lieut. HAROLD WALLER ST. JOHN (Sea Patrol).—An intrepid and skilful observer who has rendered most efficient service on reconnaissance and long-distance bombing raids. He bombed and destroyed an enemy flying boat on one raid, and on another occasion sunk a torpedo boat.

Lieut. (T. Capt.) THEODORE QUINTUS STUDD (Sea Patrol).—As pilot he has been engaged in more than 60 successful bombing raids many miles behind the enemy's lines. Capt. Studd is a most skilful pilot who can always be relied upon to carry out any task that he may be called upon to perform, no matter what adverse conditions may prevail.

Lieut. GEORGE THOMSON (King's Own Scottish Borderers).—A brilliant and intrepid observer in whom his pilot places implicit confidence when engaged in action. He has personally accounted for nine enemy machines. On one raid, when acting as escort, 15 enemy aeroplanes were encountered; of these this officer shot down two, which crashed, and one out of control.

Lieut. ERNEST HENRY TREDCROFT.—A cool and courageous observer with marked initiative. He has taken part in 41 successful bomb raids and seven photographic reconnaissances. On one raid, having dropped his bombs on a bridge, he attacked and dispersed with gun fire a number of the enemy on the bank of the river although he had received two severe wounds. On the return journey his machine was attacked by five enemy aeroplanes; with great gallantry he drove them off by his fire. He became exhausted by the exertion and severity of his wounds, which caused him to collapse in his machine.

Lieut. WILLIAM BERESFORD WALKER (H.L. Inf.).—This officer has taken part in 21 bomb raids, and has rendered excellent and valuable service in photography and general observation. He has shown himself a brave and skilful officer in action, notably on one occasion when his formation was attacked by twelve hostile scouts which approached to within short range; he engaged one at 150 yards and drove it down in flames. In another engagement he attacked one enemy aeroplane at close range and drove it down; he then engaged several others with good effect.

Capt. RICHARD PERCYVALE WARD, M.C. (R. Welsh Fus.).—Has been engaged on 37 bombing raids and on 10 photographic reconnaissances, and has been in nearly all the raids in which severe fighting has taken place. Capt. Ward has displayed the greatest coolness and courage in action, combined with ability and keenness in the work entrusted to him.

Lieut. (T. Capt.) LESLIE REGINALD WARREN (late R.N.A.S.).—This officer has taken part in 46 successful raids, 14 of which he has led. In these operations his formation has only suffered one casualty. This remarkable immunity has been in the main due to his brilliant and successful leadership; he combines keenness and determination with sound, clear judgment. In addition to raids he has taken many area photographs, and carried out five long-distance reconnaissances, rendering valuable reports.

Lieut. (T. Capt.) ERIC WATERLOW, M.C.—This officer has carried out 33 bombing raids and over 40 solo photographic and long-distance reconnaissances far over the enemy lines. In one flight he took no less than 108 photographs.



In these services he has proved himself an exceptionally skilful and resolute pilot; his railway reconnaissances have been markedly successful.

**Lieut. DONALD JAYNE WATEROUS.**—Has been engaged in 26 long-distance bombing raids, and has rendered very valuable services, especially during a raid last month when enemy formations were met in great force. Lieut. Waterous displays great keenness and determination in his work, and is always ready to volunteer for any difficult task.

**Lieut. (T. Capt.) ERIC JOHN WEBSTER (Sea Patrol).**—Has carried out several long-distance reconnaissances and engaged enemy aircraft who were superior in numbers on many occasions. A few months ago he was engaged in a fight, and on the return journey home he had three forced landings. When he reached his base one engine had practically stopped.

**Lieut. PATRICK ELIOT WELCHMAN (K.O.S.B.).**—A gallant, capable and determined leader of long-distance bombing raids. Within the last month he has rendered as deputy leader very valuable services by resolute co-operation with his leader, and the success attained was in no small degree attributable to the presence of mind and grasp of the situation which this officer displayed. Lieut. Welchman has taken part in 18 bombing raids, showing marked ability on all occasions.

**Lieut. GEORGE HEDLEY WELSH.**—During the last three and a half months this officer has taken part in 79 bombing raids. Many of these have been carried out by night, and he has displayed conspicuous bravery in descending to low altitudes to successfully attack his objective. One night he carried out four such attacks, exploding a dump, and harassing troops on the ground.

**Lieut. (T. Capt.) FREDERICK WILLIAMS, M.C.**—Since this officer was awarded the Military Cross for exceptional leadership of a long-distance bombing raid, he has taken part in 27 successful operations over the lines, 10 of which have been photographic reconnaissances. The information he has brought back has been of the greatest value. He is an excellent leader, and a most able instructor. Recently he led a formation to attack an important enemy town. Owing to thick mists and low clouds he was unable to locate his objective. Turning, he succeeded in locating another town, which he bombed with excellent effect, despite a heavy hostile anti-aircraft fire.

**Lieut. NORMAN EDMUNDSON WILLIAMS (Sea Patrol).**—Was engaged in a long-distance bombing raid on an enemy aircraft station under very difficult circumstances, and carried out a successful attack from a low height in the face of severe enemy fire.

**Lieut. (T. Capt.) CLARENCE EDWARD WILLIAMSON JONES (Manchester Regt.).**—This officer has completed over 50 successful G.B. shoots, frequently under adverse weather conditions, and in face of severe opposition from aeroplanes and anti-aircraft fire. The success of these operations was in many cases due to his courage and perseverance. On one occasion, flying at 2,000 ft., he held up for a time the advance of hostile infantry.

**Sec. Lieut. (Hon. Capt.) HUGH BRIAN WILSON (A.S.C.).**—This officer has taken part in 14 long-distance night bomb raids; by descending to low altitudes and directing his machine well over the objective he drops his bombs with great accuracy. On two recent important raids it was entirely due to his skilful observation and resolute determination that the objective was successfully reached and effectively bombed despite unfavourable weather and heavy anti-aircraft fire.

**Lieut. JOSEPH CHARLES WILSON.**—While on a photographic reconnaissance the rudder controls of this officer's machine were shot away. Shortly afterwards he was attacked by three enemy scouts; he handled his damaged machine so skilfully that his observer was enabled to shoot down one out of control, and force the remaining two to retire. He then flew back to his aerodrome, where, owing to his rudder being out of action, he crashed, fracturing both legs and an arm. In all he has carried out 66 bombing raids, invariably showing fine courage and initiative.

**Lieut. WALTER ALBERT YEULETT (Sea Patrol).**—Was engaged in a long-distance bombing raid on an enemy aircraft station, under very difficult circumstances, and carried out a successful attack from a low height in the face of severe enemy fire.

**Capt. JOHN WILLIAM BOLDERO GRIGSON; Lieut. OSWALD ROBERT GAYFORD (Observer) (Sea Patrol).**—These two officers have flown together for a period of 12 months, during which they have participated in a number of bombing raids, carried out a large number of valuable reconnaissance patrols and escort flights in all weathers, by day and night, during the performance of which duties they have brought down hostile aircraft on several occasions. No task is too difficult for these officers.

**Capt. (T. Major) EGBERT CADBURY, D.S.C. (Pilot); Lieut. (T. Capt.) ROBERT LECKIE, D.S.O., D.S.C. (Observer); Lieut. RALPH EDMUND KEYS (Pilot) (Sea Patrol).**—These officers attacked and destroyed a large enemy airship which recently attempted a raid on the North-East Coast, and also succeeded in damaging a second airship. The services rendered on this occasion were of the greatest value, and the personal risk was very considerable for aeroplanes a long way out from land.

## Awarded the Distinguished Flying Medal.

**222763 Sergt. PERCY JOHN ADKINS, D.S.M.**—A highly competent and gallant observer. He was largely instrumental in the success of two long-distance bombing raids. This non-commissioned officer uses his experience to the greatest advantage, and has set a fine example of devotion to duty.

**202615 Corpl. (Aerial Gunlayer) LEONARD ALBERT ALLEN.**—One of the keenest and most reliable gunlayers in his squadron. He has frequently been in action with enemy aeroplanes and has flown for 100 hours on photographic and reconnaissance flights.

**204157 Corpl. (E) WILLIAM NORMAN BLACKLOCK, D.S.M.**—Whilst in action the oil tank of one of his engines was struck. Exposed to very heavy fire this mechanic, regardless of danger, went out on the plane, and, with his hand, stopped a heavy leakage of oil, and so enabled the machine to fly a considerable distance and land within reach of help.

**K/23007 1st Pte. Aerial Gunner SYDNEY FRANK BRIGGS.**—For distinguished service in an attack on an enemy seaport, when he sunk a hostile destroyer by a direct hit from a bomb.

**206181 Sergt. Mech. THOMAS CAIRD, D.S.M.**—Has assisted to destroy hostile aircraft on several occasions, and had been frequently in action. Sergt. Caird has been twice shot down in flights a long distance away from his base, and always performs his duties with gallantry and zeal.

**224573 Sergt. Mech. WILLIAM GEORGE CHAPMAN, D.S.M.**—Has been a member of a seaplane crew on practically every long-distance patrol. He has taken part with zeal, gallantry and coolness in numerous engagements with hostile aircraft.

**223740 1st Pte. (Gunlayer) JAMES CHAPMAN.**—During a recent raid four of our machines were attacked by 12 enemy aeroplanes. The pilot of this observer's machine was badly wounded and lost consciousness. The machine fell out of control, but Pte. Chapman took control from his seat and flew the machine back to our aerodrome, and landed without breaking a wire, exhibiting skill and presence of mind worthy of the highest praise.

**65289 1st Pte. (A. Sergt.) ERNEST CLARE.**—Has been engaged on 17 long-distance bombing raids. He has displayed skill and coolness in handling his gun on the numerous occasions in which his formation has been attacked by hostile aircraft. Sergt. Clare has rendered valuable services as an observer on photographic reconnaissances as well as on long-distance raids.

**F/9689 Act. A.M. (W. T.) ALBERT EDWARD CLARK.**—Has been employed flying as an observer for nine months, during which period he has rendered valuable services; on two occasions he dropped bombs over enemy submarines.

**202067 Sergt. Mech. SYDNEY HINTON CROOK.**—Has carried out a great deal of useful work as engineer on seaplane long-distance patrols. Has been in many engagements with hostile seaplanes, and has always behaved with courage and coolness.

**228395 3rd A.M. (W. T.) CYRIL RUPERT DEERLEY.**—Has carried out consistently good work on special reconnaissance patrols over hostile waters. On a recent occasion he established wireless telegraphic communication with his base from a distance of 140 miles, after half his aerial had been shot away by hostile aircraft.

**121180 Sergt. WILLIAM DYKE, D.C.M.**—On all occasions this N.C.O. observer has carried out his work conscientiously and well, notably when engaged on photographic service, obtaining excellent results often under very difficult conditions. Since joining his present squadron he has taken part in 29 bombing raids, 10 photographic flights, and 14 reconnaissances, many at low altitudes. On four occasions he has encountered large formations of enemy aeroplanes, and has himself shot down out of control three machines.

**210359 2nd A.M. (W.T.) GEORGE ALFRED GIBBS.**—Has been engaged on long patrols for 12 months; carries out his duties under fire with gallantry, and can be thoroughly relied upon in any emergency.

**113763 Sergt. JOHN CHARLES HAGAN.**—A gallant and skilful aerial gunner who shows the greatest keenness in his work on patrol. On one occasion he shot down an enemy machine after he himself had been wounded.

**210675 Pte/2 (Gunlayer) ARTHUR TOM HARMAN.**—For gallantry in the air is assisting in the destruction of an enemy airship which recently attempted a raid on the North-East Coast of England. One airship was completely destroyed and another was damaged.

**222927 1st Pte. (Aerial Gunner) ALBERT EDWARD HUMPHREY.**—When escorting an important reconnaissance his machine was attacked by eight enemy aeroplanes. After firing several rounds his gun jammed, when he immediately picked up his spare gun, and, firing from his shoulder, brought down one of the enemy machines and continued firing on the others until he was severely wounded. Aerial Gunner Humphrey has been 23 times engaged over enemy territory, and has proved himself gallant and resourceful on all occasions.

**204706 A./A.Mt. (G) Gunlayer WILLIAM JONES.**—He has taken part in 105 successful bombing raids and has shown conspicuous courage and determination often in the face of strong opposition and intense anti-aircraft fire. He has destroyed or brought down out of control six hostile machines.

**225232 A.M. 1st Gd. (E) DOUGLAS WILLIAM KIRBY.**—Whilst in action, his oil tank being pierced by a bullet, this airman climbed on to the wing and endeavoured to stop the flow of oil. Although exposed to heavy fire, he most gallantly remained at his post till the engine finally failed.

**7054 Sergt.-Observer FREDERICK LEE.**—During a recent long-distance bombing raid the formation to which Sergt. Lee belonged was attacked when over the objective by 20 enemy scouts. He engaged one of them with his double gun, which caused the enemy machine to turn over on its back, and after various gyrations the pilot fell out of the aeroplane. This N.C.O. has proved himself a gallant and skilful observer, and in all respects a most reliable man in the air.

**208711 1st A.M. ALEXANDER ROBERTSON MOYES.**—Has always displayed gallantry and devotion to duty. Has flown for more than 300 hours in seaplanes, and has been in action with hostile aircraft on numerous occasions.

**203962 2nd A.M. (Gunlayer) DAVID LEWIS MOXEY.**—An excellent gunlayer observer. During a late raid he shot down and destroyed an Austrian seaplane, displaying marked skill and resource.

**F16604 A.C.T. (Gunlayer) WILLIAM JAMES MIDDLETON.**—He has taken part in 67 raids and has shown conspicuous gallantry and skill in bombing enemy lines of communication, dumps and aerodromes. On one occasion he obtained six direct hits, despite intense anti-aircraft fire.

**617162 1st Pte. ARTHUR NEWLAND.**—He is an excellent shot, and has done remarkably well as an observer, gaining the confidence of the pilots with whom he has served. He has personally assisted in shooting down five enemy aeroplanes.

**211300 Sergt. CECIL ARTHUR OTWAY.**—A very skilful observer on long-distance bombing raids. On a recent occasion, owing to exceptionally bad visibility, the objective town could not be found by the pilot. Sergt. Otway persisted and eventually found the locality, and the great enemy war factory was most successfully bombed. This non-commissioned officer displays exceptional ability and great determination in the carrying out of any task assigned to him.

**21530 1st A.M. CECIL HERBERT PALMER.**—This airman displays conspicuous gallantry and devotion to duty. On six occasions he has been shelled while on observation duty in a balloon, but he has invariably completed his task. In one attack his balloon was punctured in nine places.

**205416 Corpl. Mech. THOMAS MAYNE REID.**—Has flown for 300 hours in seaplanes, and has been engaged in many long reconnaissances. Recently he was forced to alight after a fight with hostile aircraft, and effected an engine repair on the spot, which enabled the seaplane to return home.

**206515 Sergt. Mech. (E) HENRY ROBERT STUBBINGTON.**—Deserves the highest praise for his coolness and skill in repairing the oil pipe of his seaplane in a very heavy sea. The damage occurred in an attack on a Zeppelin, and his good service in repairing the pipe prevented the machine falling into the hands of hostile destroyers which were in pursuit.

**221380 Corpl. (Gunlayer) GEORGE ERNEST THRIFT.**—A most reliable gunlayer observer who has taken part in numerous bombing raids, invariably rendering valuable service.

**225673 1st Pte. (Gunlayer) DOUGLAS WENTWORTH.**—Whilst taking part in a bombing raid on hostile docks his machine was attacked by several enemy aeroplanes and badly shot about, the petrol supply pipe being perforated. Realising the danger of the machine catching fire, Pte. Wentworth, with great courage and presence of mind, climbed over the pilot and stopped the leakage with his hand.

## Awarded the Air Force Cross.

**Capt. JOHN AUGUSTE BORET, M.C. (R. West Surrey Regt.).**  
**Capt. SIDNEY ROBERT STAMMERS.**

## Awarded the Air Force Medal.

**21929 Signalman COLIN HAZLEWOOD (Observer).**

The undermentioned Officers and other Ranks have been brought to notice in Despatches and Reports, for valuable services rendered:—

**Lieut. EDWARD JOHN ADDIS (Sea Patrol).**

**Capt. RENE MAURICE BAYLEY (Sea Patrol).**

**Lieut. LESLIE WALLIS BEAL (Pilot, temporary Sea Patrol duty, 36th squadron).**

**Major the Hon. ROGER COKE (Airship Service).**

**Lieut. GRAHAME HEATH (Sea Patrol).**

**Lieut. (Hon. Capt.) JOHN FREDERICK HORSEY (Sea Patrol).**

**Lieut. GORDON FRANK HYAMS, D.F.C. (Sea Patrol).**

**Pilot-Ensign P. J. IVES, U.S.A., Aviation Service (Sea Patrol).**

**Capt. GEOFFREY LITTLETON LEWIS (Airship Service).**

**Pilot-Ensign J. F. McNAMARA, U.S.A., Aviation Service (Sea Patrol).**

**Lieut. JAFFRAY JOHN WALTER NICHOLSON (Sea Patrol).**

**Lieut. FREDERICK WILLIAM PICKUP (Sea Patrol).**

**Lieut. JOHN NETTLETON RABY (Observer), temporary Sea Patrol duty (36th Squadron).**

**Lieut. ALBERT CYRIL SHARWOOD (Sea Patrol).**



Capt. CHARLES THOMAS TYRER (Sea Patrol).  
 Sec. Lieut. THOMAS WILLIS (Sea Patrol).  
 208368 1st Class Clerk A. H. ASHTON.  
 204286 Sergt. Mech. R. H. (C.) F. B. CLARK  
 219078 Sergt. (G) J. A. HELSDEN.  
 5485 Flt. Sergt. C. W. JAMES.  
 6312 Sergt. H. A. LONGMAN.  
 201149 Chief Mech. (E) L. G. MILES.  
 208042 Sergt. Mech. (E) R. H. POWELL.  
 208284 1st A.M. (A) E. A. STALLY.

**Awards of Foreign Decorations.**

**DECORATIONS CONFERRED BY THE GOVERNMENT OF THE FRENCH REPUBLIC**

*Awarded the Croix d'Officier of the Legion of Honour.*

Lieut.-Col. (T. Brig.-Gen.) TOM INCE WEBB-BOWEN, C.M.G. (Bedford Regt.).

*Awarded the Croix d'Officier of the Legion of Honour and Croix de Guerre.*

Lieut.-Col. GEORGE WILLIAM PATRICK DAWES, D.S.O. (R. Berks Regt.).

*Awarded the Croix de Chevalier of the Legion of Honour and Croix de Guerre.*  
 Lieut. (T. Capt.) GERALD ERNEST GIBBS, M.C.

*Awarded the Croix de Chevalier of the Legion of Honour.*

Capt. (T. Major) GILBERT WARE MURLIS GREEN, D.S.O., M.C.

*Awarded the Croix de Guerre.*

Sec. Lieut. ALLAN FINLAY ALEXANDER.

Lieut. WILLIAM GEORGE BARKER, D.S.O., M.C.

Lieut. THOMAS HENRY BARRY (R.G.A.).

Capt. (T. Major) CHARLES EDGAR BRYANT, D.S.O. (7th Hussars).

Capt. FREDERIC CARR.

Lieut. CHARLES REAY COFFEY. (Killed May 27th 1918.)

Lieut. (T. Capt.) STANLEY BERESFORD COLLETT (Durham L.I.).

Capt. (T. Major) JOHN OGILVIE DAVIS, M.C.

Lieut. ARTHUR NOUGHT DUFTON.

Lieut. ACHESON GOSFORD GOULDING, M.C.

Capt. AUGUSTUS FRANCIS WOODWARD GREGORY.

Lieut. REUBEN GEORGE HAMMERSLEY.

Sec. Lieut. EARL McNABB HAND.

Lieut. CHARLES PHILLIP HARRISON, M.C. (R.E.).

Lieut. (T. Capt.) RICHARD HARRISON.

Lieut. BERTRAM HEAD, M.C. (North'd Fus.).  
 Major GEORGE HENDERSON (Indian Army).  
 Lieut. (T. Capt.) JAMES DUFF HEWETT.  
 Lieut. HAROLD WOOLF HIGHAM (Notts & Derby).  
 Lieut. HUGH PUGHE LLOYD, M.C.  
 Capt. FREDERICK WILLIAM LOWEN.  
 Capt. (T. Major) WILLIAM ROBERT BROWN McBAIN, M.C.  
 Sec. Lieut. ANTHONY NUGENT.  
 Lieut. CHARLES DUDLEY PALMER (A. & S. Highrs.).  
 Capt. SAMUEL RICHARD PENROSE-WELSTEAD, D.F.C.  
 Lieut. (T. Capt.) GEOFFREY ARTHUR HENZELL PIDCOCK.  
 Lieut. (T. Capt.) EDMOND ROBERT HARRIS POLLAK, M.C. (R. Artillery).  
 Lieut. GEORGE AUGUSTUS BELLAIR ROSS (Liverpool Regt.).  
 Lieut. (T. Capt.) EDWARD TELFORD DE LAURET SIMPSON.  
 Capt. RICHARD PERCYVALE WARD, M.C. (R. Welsh Fus.).  
 Lieut. FREDERICK WILLIAMS.  
 Sec. Lieut. PERCY WILSON.  
 240289 Sergt. Mech. (Observer) FRANCIS LEONARD ROBERTS.

**DECORATION CONFERRED BY THE GOVERNMENT OF ITALY.**

*Military Order of Savoy—Officer.*

Lieut.-Col. (T. Brig.-Genl.) TOM INCE WEBB-BOWEN, C.M.G.

**DECORATIONS CONFERRED BY THE GOVERNMENT OF BELGIUM.**

*Croix de Guerre (Belgian).*

Col. (T. Brig.-Genl.) CHARLES LAVEROCK LAMB, C.M.G., D.S.O.

*Chevalier de l'Ordre de la Couronne.*

Lieut. JOHN CUNNINGHAM MITCHELL.

**DECORATIONS AWARDED BY THE HELLENIC GOVERNMENT.**

*Silver War Medal.*

Lieut. (Hon. Capt.) CHARLES GILMOUR, D.S.C.

Lieut. (Hon. Capt.) HAROLD THOMAS MELLINGS, D.S.C., D.F.C.

*Cross of Commander of the Order of the Redeemer.*

Lieut.-Col. GEORGE WILLIAM PATRICK DAWES, D.S.O. (R. Berks. Regt.).

His Majesty the King has granted unrestricted permission for the wearing of the above-mentioned decorations.



# The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

**THE FLYING SERVICES FUND**

(Registered under the War Charities Act, 1916).

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**Objects:**

The Lords Commissioners of the Admiralty and the Army Council having signified their approval, THE ROYAL AERO CLUB has instituted and is administering this Fund for the benefit of Officers, Non-Commissioned Officers and Men of the Royal Air Forces who are incapacitated on active service, and for the widows and dependants of those who are killed.

**Subscriptions.**

	£	s.	d.
Total subscriptions received to Sept. 17th, 1918	13,096	2	5
Collected by C. F. Treble .. .. .	1	8	4
Sterns, Ltd. (Finsbury Square) .. .. .	26	5	0

Total, September 24th, 1918 .. .. 13,123 15 9

Offices: THE ROYAL AERO CLUB,  
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H. E. PERRIN, Secretary.

**Aircraft Workers' Wages.**

THE following is a recent decision given by the Committee on Production on a case which has been referred to them by the Ministry of Labour:—

"Aircraft Workers.—From August 10th, 1918, an advance of 3s. 6d. per week to skilled woodworkers, painters, polishers, dopers, and upholsterers in aircraft establishments, that is, any manufacturing establishment engaged wholly on the manufacture or repair of aeroplanes or seaplanes or of components or parts thereof, and any workshop belonging to a composite establishment in which such work is exclusively carried on."

**Famous French Athlete-Aviator Missing.**

It was learnt in Paris on September 19th that Maurice Boyan, the French aviator, who has destroyed 35 German aircraft, including 18 kite balloons, was missing, having been seen to go down in flames in the German lines. He had been awarded several decorations, and had just been promoted

Officer of the Legion of Honour. He had captained Rugby teams against England, Scotland, Wales and New Zealand.

**An American Ace Killed.**

LIEUT. DAVID PUTNAM, of Boston, who used to fly with the French squadron of which Lieut. Fonck is now chief, was killed at Limey on September 12th. He was shot down by a German whose machine was seen to catch fire and fall as he made away, being Lieut. Putnam's 15th victim.

**Honours for d'Annunzio.**

MAJOR GABRIELE D'ANNUNZIO was publicly presented on September 15th with a Caproni biplane consecrated to the memory of Nazario Sauro, the Italian sailor who, having escaped from Austrian subjection at the beginning of the war, was taken into service in the Italian Navy, and captured and hanged at Pola.

In the name of King Albert, General Morel, Chief of the Belgian Military Mission at the Italian Headquarters, last week presented Major d'Annunzio with the Belgian Croix de Guerre.

# AERO MOTORS AT KING'S COLLEGE.

## SOME TECHNICAL IMPRESSIONS.

### The Forward View.

It is more in view of the development of the commercial side of aviation after the war than its present military aspect, that the indications of the few aeromotors displayed at the recent London University Exhibition are interesting and important. Also in a way, significant; although one may be well aware that they represent but few of the types actively projected, or even actually available. Indeed, the motor section of an aero show we could produce, were conditions normal, would astonish even the insiders of flight.

Such a forward view then is the standpoint and pretext of the present article. To-day, so long as a given aeromotor can definitely achieve a certain task, mostly within tactical rather than strategic ranges of travel, and with the maintaining labour available to any amount, at a trifle over a shilling a day, prime cost, consumption, durability and upkeep trouble matter but little, apparently. When it comes to commercial development, they certainly are going to matter a great deal. For they not only all spell Efficiency, but much more than they even did in automobilism, they are going to make up the factor of sheer safety.

Few as the exhibits are, there is much that for obvious reasons cannot be disclosed. On the other hand there is still enough left to show not only the "state of the art" in aeromotor engineering, but also to prove that the British product—here one does not refer to the mere reproduction of foreign models—remains well advanced. Safely enough, too, there seems to be much that can be usefully written, as of any motor, as a mere abstract of visible practice.

### A Great Continental Example.

For example, there is one very notable model of the 8-cylinder V-type, of Continental origin and much fame; inasmuch as it represents that school of construction in which aluminium cylinder-bodies, with steel liners screwed into them throughout their length, are the chief feature. Externally, there is admittedly no more handsome design. Not only does the monobloc formation of each cylinder-tier render it very clean—even the cruciform induction manifold hardly seems to encumber the middle space—but the crank chamber moulding is exquisitely curved in every direction to resist the probable stresses. What little there is of accessory detail is designed for quick dismantling; and there are various little points that display much ingenuity.

It is only when the sections are examined that the make-up of the motor, rather than its basic construction, declares itself faulty. The water-spaces are as ample as they should be: but cast as they are in one piece, the thicknesses of the cylinder bodies and water jackets are all anyhow; much too thick—the latter excessively so—and uneven. That does not make for reliability. It is all the worse that it does not show in the ordinary way. Worst of all in this model, the occurrence of the slightest inferior defect—to say nothing of the need to re-grind a valve—means dismantling the entire block.

### And Its British Analogue.

Of the same general system of construction is the largest and most prominent exhibit, all-British. Nevertheless, it affords a striking contrast, not only because it is a 6-cylinder vertical, but because its constructive design avoids nearly all these defects, and with but two or three slight detail alterations involving no change of dimension, would eliminate every one of them. Indeed, one imagines that it would then represent as commercial a production as need be, apart from the immediate accessibility imparted.

This motor has its cylinders mounted as two triads: and their heads, with their jacketing also thus formed, in two aluminium castings; these latter including the combustion chambers only, which appear to be of ample thickness, and are slightly "minaretted" on the exhaust side. Into these the steel cylinders, which are a useful  $\frac{1}{4}$  of an inch thicker than in the first example, are screwed, but only to a depth of 2 ins., thus leaving all thicknesses even, for the main jacketing. This, also of aluminium, cast separately as a triad, is consequently even in all dimensions, and desirably thin. At the bottom it has inward flanges enclosing rubber gaskets, which make a water-tight joint with rings into which the cylinder tubes are screwed. But at the top it makes a large and difficult flange-joint with the head-casting, secured with a great number of little bolts.

### Some Points of Advanced Practice.

One may therefore suggest that since the cold water is pumped direct into the head jacketing from the rear end,

Maybach fashion, and the two triads form a central water joint, in the Spyker-Maybach manner, the cylinder jackets might as well have been formed in singles, and had their tops screwed into extensions of the head-casting, as the cylinders are. For they could have been just as well united for continuous circulation below, with ring-unions, in the manner of the Benz cylinders.

Even distribution of the cold water to all heads simultaneously is secured by a thin slotted tubular formation running from the inlet directly forward through the mid-line of the head castings. One has seen this feature before, in the Hall-Scott design, but it is no less effective. Otherwise it might be said that the water spaces around the twin exhaust valves were a trifle scanty.

Piping and jointing is freely eliminated, and the construction given the neatest appearance, by embodying the induction manifolds with the head castings; each triad having its carburettor suspended by a short trunk-piece. Here again one recognises gratefully a previous suggestion.

The hollow overhead cam-shaft is enclosed, very neatly, in a long rectangular casing, oil-tight for free cam-shaft distributed lubrication. Also very accessibly, the sides being freely panelled. The cams act direct on the spring plates of the exhaust valves—which have watch-type helical springs—but opposite the single inlet valves through short rockers pivoted in lugs from the top of the casing. This arrangement disencumbers the construction, and enables the valve-gear encasement to be brought at least 2 ins. lower than usual.

### And Some Suggestions.

Thus so far conditions, wholly unaltered, favour a further possible improvement. The bell-type hollow-stemmed valves are all three seated in bronze rings, pressed into the metal of the head castings. If the factors of expansion under heat be equal, as one assumes, all may be well. But there appears to be such ample room for these ring seatings that it is clear that detachable box-seatings of the Maudslay or Green type would have served far better. Then any valve and its seating might have been lifted clear through the valve-gear casing. As it is, the whole triad, cylinders and all, must be lifted: although the dog-claw or yoke attachments of the cylinders to the crank chamber facilitate such dismantling, the said yokes being mounted on the through-bolts that apparently suspend the crank-shaft bearings from the top in the approved manner.

### Minor Details.

The relative timing of the inlet and exhaust valves—the figures for which cannot obviously be given—promises that the fullest power indicated by the cylinder dimensions will be developed. That this is likely to be considerable is also indicated from the exceptional dimensions of the crank shaft, which is lightened, nevertheless, by the freest hollowing; that also serves for the main lubrication-conduit to all working parts. A very dainty detail, on the other hand, is the way in which the otherwise free gudgeon-pins are kept from moving endways by little rings of wire sprung into grooves in the piston-lugs. These cannot shift in work, yet a pull of the finger can dislodge them.

With the main oil-pump driven below the water pump, and on the same spindle—all from the main bevel on the crank-shaft tail—the lubrication is apparently of the dry sump kind most approved. Only, although located so low, one imagines it might go wholly dry in a long *vol-plané*. One may therefore suggest that a tubular formation, cast lengthwise, keel-fashion, externally of the base chamber, yet with openings to draw from it in the middle and at the front end, and non-return valves at these two points, would overcome such a possibility. This pump, however, apparently connects, though the union is absent, with a second smaller pump acting as a non-return valve, delivering into the open end of the crank-shaft. As a final detail of a really exemplary British aeromotor, dual ignition is fitted, from a Fellows magneto to all the plugs on the starboard side, and from a Remy coil to those on port; the distributor in the latter case being mounted on the tail-end of the cam-shaft. The air-starter device specified was not mounted.

### Other Notable Exhibits.

A small, but no less interesting exhibit, was a single cylinder—evidently from a V-motor—of a Midland make that has done great war service. In this, one feature was the free panelling of the water jacket, so much so as to afford the



greatest assurance of even dimensioning all over the cylinder walls; and another, the lug attachment of the big-end of one connecting rod to the foot of the other. This is the method of one American aeromotor, in that instance distinctly faulty. In this case, however, the relative angle of the opposite cylinders, and of the lug itself, agrees so that anywhere about the firing period the lug is in true line with the attached rod; so that the explosion shock is probably directly taken, with no undue strain on pin or lug, and little or no "necking" effect to weaken the latter. Still, one suggests that it is not a point of practice to copy, as there are other and more effective methods of obtaining the direct opposition of cylinders and a short wrist-pin.

It may also be suggested somewhat as a defect of all these examples so far, that the piston rings, few or numerous, were all extremely stiff and likely to subtract from power developed. We seem to await improvement in this detail.

A fine example of the 12-cylinder model of Rolls-Royce make is also on view. Detail description is, of course, not permissible, so the only impression of it that can be conveyed—perhaps the most comprehensive—is the manifest studiousness

of its detail! Hence, doubtless, its established reliability. It may perhaps be urged that there may be more commercial designs for quantity production on a commercial basis. But that is not the intention of the design, so much as reliability for present Service needs.

The same may be said of the Beardmore "six"; the features of which are long familiar to most readers of "FLIGHT," and, one imagines, call for no technical criticism not long since thrashed out. Two examples of the Rhone and Clerget rotaries were shown, particularly interesting for the peculiar eccentric distribution gear each embodies: the action, converse in each case, obtaining the same motion—result; the one by a progressive throw and the other directly. Both afforded, as reproductions, the most refined examples of British material and workmanship and it may be that the rotary type has not outlived its usefulness nearly as much as is sometimes contended. Its power limit may have been reached, but there may be all sorts of arrangements of application for which the demands of war forbid experiment, that, when exploited, may keep it in commercial use.

G. DE H. S.

## A NEW GERMAN "CHASER."

### THE SIEMENS-SCHUCKERT BIPLANE.

The following is a translation of an article published in *Le Matin* of August 18th:—

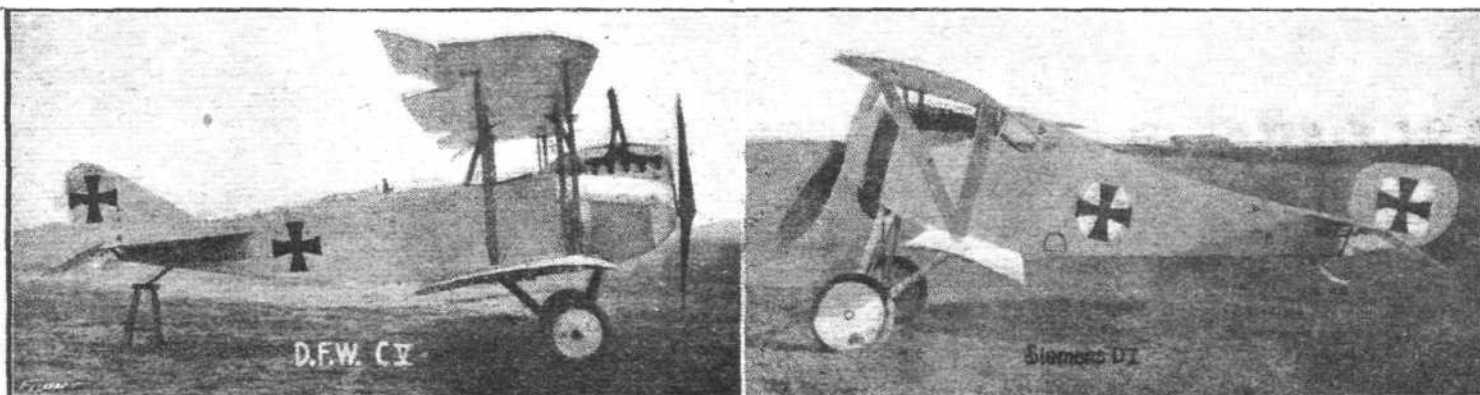
"The reverses which the Germans have suffered with their 'chasers,' which since last March have been very much inferior to those of the Allies, have led them to venture into new designs.

"Some time ago we have remarked upon the new Fokker D VII biplane, whose fighting value is far below that of the Allies' fighting 'planes. Our enemies have also put into service the Halberstadt C II fitted with a 160 h.p. motor (Mercedes). They hoped to make a record with this machine, but they were forced to recognise that the relatively slow speed of the machine—165 kilometres per hour—its great

"The rotary motor of 260 h.p. moves a four-bladed propeller after the English fashion. Certain 'planes of the same type are fitted with the modified 260 h.p. Mercedes.

"The armament consists of two machine-guns firing together or separately, through the propeller.

"The Germans say that this aeroplane is very easy on controls and that it 'stunts,' and in particular 'cartwheels' and 'loops' with surprising ease. They also say that its climbing speed is excellent, and that it climbs to 6,000 metres in 15 minutes. They have said the same of their Pfalz, their Fokkers, and their Halberstadts, that one is tempted to believe that they take their ideals for realities!



On the left a type C 5 D.F.W. biplane. Note the housing around the engine. On the right the Siemens Single-Seater. From the fact that it is said to be the type D I, and a publication of the illustration in a German paper has been allowed, it appears improbable that this is one of the Siemens-Schuckert machines of which a good deal is now heard and seen on the Western Front. The machine has a distinctly "Nieuporty" appearance.

weight of 45 kgs. per square metre of carrying surface, made it inferior to our machines in speed and handiness.

"For some little time the Germans have placed in their fighting squadrons a few of the new Siemens-Schuckert biplanes, fitted with a rotary motor, eleven cylindered, and giving 260 h.p.

"The Siemens-Schuckert workshops which are producing this new chaser also construct large bombing machines of the Lizenz type with three or five motors.

"This 'chaser,' with a span of 7 metres and 6 metres in length, is short and squat in appearance. To obtain stability it has been necessary to fit a fixed plane to the tail, and to have an elevator of large dimensions.

"The upper and lower planes are of the same span, and balanced ailerons are fitted to both planes. The upper plane is rectangular in shape; it is made in one piece, but cut away to allow the pilot a better view. The lower plane is staggered to the rear, but it is of smaller chord than the upper wing.

"But what must be remembered is the haste with which the Germans have tried to invent and to construct new machines in order to recover a little of the prestige of their air services which has been in a bad way for the last six months. The construction and transport has not been without difficulty. Witness the orders for the 40th Division:—

"The slowness which is found in the replacing of aeroplanes and in the repair of existing machines, and the ever-increasing difficulty of recruiting the personnel of the air services, oblige us to economise in our air forces. The forces will be directed with the distinct intention of refusing to participate in any mission which is not of primary importance in the war. This severe discipline, necessary because of the artillery action (which ought not to be held up for an instant during the present artillery duel), will not permit the use of battle planes for a moment longer than is absolutely necessary."

#### More Protests by Holland.

HOLLAND has protested to Germany against the violations of Dutch territory by a German monoplane flying over the

town of Sas van Gent on August 15th. Holland has also protested to Germany against violation of Dutch territory by German aeroplanes on August 4th and August 21st.

# THE 300 H.P. MAYBACH ENGINE.

Issued by the Technical Department (Aircraft Production), Ministry of Munitions.

(Concluded from page 1063.)

## Engine Test Report at R.A.E. 5.4.18.

**Calibration and Endurance Tests.**—The Maybach engine (No. 1261), after several slight repairs had been carried out to the cylinders and propeller hub flange and coupling, was erected on a test bed, coupled to a Heenan and Froude dynamometer, and submitted to the following power and consumption tests, including a one hour's duration test at normal speed. The results of the calibration tests are as follows:—

r.p.m.	1,200	1,300	1,400	1,500
b.h.p.	258	279	294.5	304.5
Brake, m.e.p.	120.5	120.3	118	113.9

Petrol consumption in pints b.h.p. hour .. .53 .52 .526 .545

The results of these tests are shown graphically on the diagram (Fig. 46).

**One Hour Test.**—At the conclusion of the above tests a run of one hour's duration at normal revolutions (1,400 r.p.m.) was carried out with the following results:—

Average b.h.p. .. 290.  
Petrol consumption .. 20 gallons = .55 pint per b.h.p. hour.

Oil consumption .. 11 pints = .038 pint per b.h.p. hour.

Oil pressure .. 5 lbs./sq. in.

Oil temperature .. 67°C.

Water temperature (inlet) .. 57°C.

Water temperature (outlet) .. 68°C.

### Valve Timing During Tests.

Inlet.	Exhaust.
O. 8°E.	O. 33°E.
C. 35°L.	C. 7°L.
Magneto advance ..	38°E.

Running was steady at all speeds between 900 and 1,400 r.p.m., but owing to the fact that the propeller hub flange on the crankshaft was damaged, and was running slightly

out of truth, the vibration became excessive above 1,400 r.p.m.

Considerable trouble was experienced with the water connection between the cylinders on the exhaust side. The running became unsteady below 900 r.p.m.

**Distribution.**—Owing to the exhaust manifold being fitted as part of the engine starting gear, it was not possible to form an idea of the distribution.

A diagram of the inlet and exhaust valve lift is shown graphically in Fig. 47.

## General Data.

Make of engine and rated h.p., Maybach 300 h.p.; type number, 1261; number and arrangement of cylinders, six vertical; bore, 165.0 mm. = 6.50 in.; stroke, 180.0 mm. = 7.09 in.; stroke bore ratio, 1.09:1; area of one piston, 213.825 sq. cm. = 33.2 sq. in.; total piston area of engine, 1,282.95 sq. cm. = 199.2 sq. in.; swept volume of one cylinder, 3,848.85 cu. cm. = 235.3 cu. in.; total swept volume of engine, 23,093.1 cu. cm. = 1,412 cu. in.; clearance volume of one cylinder, 778.9 cu. cm. = 47.54 cu. in.; compression ratio, 5.95:1; normal b.h.p. and speed, 294.0 b.h.p. at 1,400 r.p.m.; maximum b.h.p. and speed, 304.5 b.h.p. at 1,500 r.p.m.; normal b.m.e.p., 117.7 lbs. per sq. in. at 1,400 r.p.m.; maximum b.m.e.p., 120.5 lbs. per sq. in. at 1,200 r.p.m.; piston speed, 1,654.0 ft. per min. at 1,400 r.p.m.; mechanical efficiency (calculated), 86.0 per cent.; indicated mean pressure (calculated), 137.0 lbs. sq. in.; fuel consumption per b.h.p. hour, 0.526 pint = 0.473 lb.; brake thermal efficiency, 28.9 per cent.; indicated thermal efficiency, 33.6 per cent.; air standard efficiency, 51.0 per cent.; relative efficiency, 65.9 per cent.; cu. in. of swept volume per b.h.p., 4.80 cu. in.; sq. in. of piston area per b.h.p., 0.678 sq. in.; h.p. per cu. ft. of swept volume, 360.0 b.h.p.; h.p. per sq. ft. of piston area, 212.4 b.h.p.; direction of rotation of crankshaft, anti-clockwise (facing propeller); direction of rotation of propeller, anti-clockwise (facing propeller); type of valve gear, overhead valve rockers and push rods; type of starting gear, Maybach of special design; number of carburetors, two Maybach; bore of main jets, variable from 0.0 to 2.5 mm.; bore of pilot jets, variable from 0.0 to 1.1 mm.; fuel consumption per hour, 19.33 gallons.

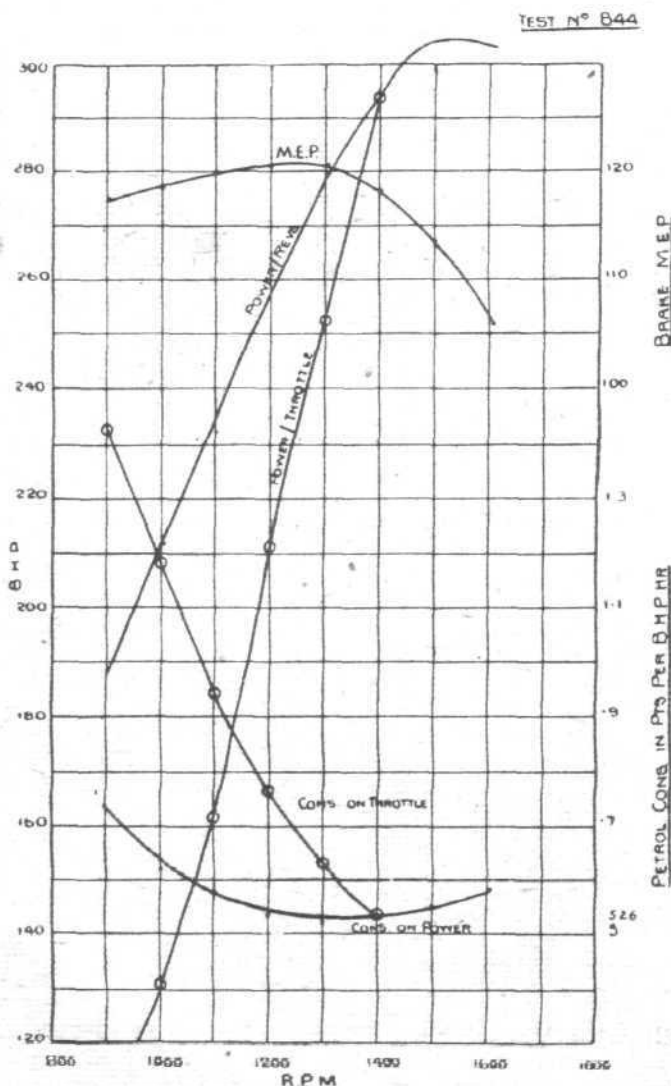
**Valve Areas and Gas Velocities.**—Diameters—Induction pipe, 62.0 mm. = 2.44 in.; inlet port, 45 × 67 mm. = 1.77 × 2.64 in.; exhaust port, 45 × 67 mm. = 1.77 × 2.64 in.; exhaust branch pipes, 66.0 mm. = 2.60 in. (approx.).

Cross sectional areas—Induction pipe, 29.26 sq. cm. = 4.67 sq. in.; inlet port, 30.15 sq. cm. = 4.67 sq. in.; inlet valve (πdh.), 4.416 sq. in. (total); exhaust valve (πdh.), 4.366 sq. in. (total); exhaust port, 30.15 sq. cm. = 4.67 sq. in.; exhaust branch pipes, 34.11 sq. cm. = 5.31 sq. in.

Gas velocities—Induction pipe, 196.1 ft. per sec.; inlet port, 196.1 ft. per sec.; inlet valve, 208.0 ft. per sec.; exhaust valve, 210.0 ft. per sec.; exhaust port, 196.1 ft. per sec.; exhaust branch pipes, 172.5 ft. per sec.

**Inlet Valves** (two per cylinder).—Outside diameter, 54.0 mm. = 2.126 in.; port diameter (in cylinder head), 48.0 mm. = 1.89 in.; width of seating, 3.5 mm. = 0.137 in.; angle of seating, 30°; radius under valve head, 20.0 mm. = 0.787 in.; lift of valve, 9.45 mm. = 0.372 in.; diameter of stem, 11.0 mm. = 0.433 in.; over-all length of valve, 136.5 mm. = 5.373 in.; number of springs per valve, one; free length of spring, 52.5 mm. = 2.066 in.; length of spring in position (no lift), 39.5 mm. = 1.55 in.; mean diameter of coils, 51.0 mm. = 2.00 in.; gauge of wire, No. 6 B.W.G.; ratio length of spring/lift of valve, 4.17:1; weight of valve complete with spring, 0.843 lb.; weight of spring bare, 0.281 lb.; inlet valve opens, deg. on crank, 8° early; inlet valve closes, deg. on crank, 35° late; period of induction, 223°; inlet tappet clearance, 0.3 mm. = 0.012 in.

**Exhaust Valves** (two per cylinder).—Outside diameter, 54.0 mm. = 2.126 in.; port diameter (in cylinder head), 48.0 mm. = 1.89 in.; width of seating, 3.5 mm. = 0.137 in.; angle of seating, 30°; radius under valve head, 9.0 mm. = 0.354 in.; lift of valve, 9.34 mm. = 0.368 in.; diameter of stem, 11.0 mm. = 0.433 in.; length of valve guide, 80.0 mm. = 3.149 in.; over-all length of valve, 152.5 mm. = 6.00 in.; number of springs per valve, one; free length of spring, 52.5 mm. = 2.06 in.; length of spring in position (no lift), 39.5 mm. = 1.55 in.; mean diameter of coils, 51.0 mm. = 2.00 in.; gauge of wire, No. 6 B.W.G.; ratio, length of spring/lift of valve, 4.21:1; weight of valve complete with spring, 0.881 lb.; weight of spring bare, 0.281 lb.; exhaust



POWER CURVE CORRECTED FOR BAROMETER

Fig. 46.—Calibration curves. R.A.E. tests.



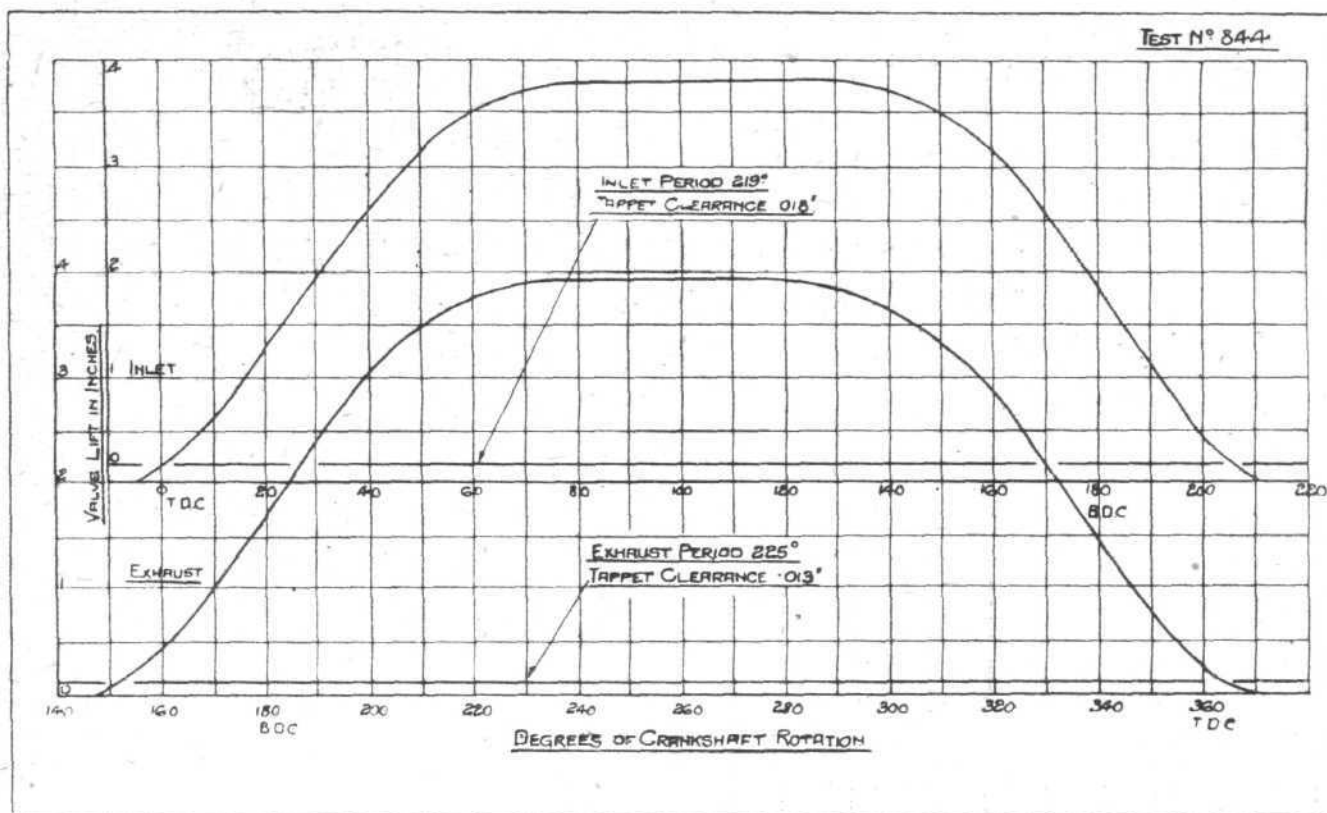


Fig. 47.—Diagram of valve lift. R.A.E. tests.

valve opens, deg. on crank, 33° early; exhaust valve closes, deg. on crank, 7° late; period of exhaust, 220°; exhaust tappet clearance, 0.4 mm.

**Inertia Forces, Bearing, Loads, &c.**—Weight of piston, complete with rings and gudgeon pin, 14.05 lbs.; weight per sq. in. of piston area, 0.4235 lb.; weight of connecting rod complete, 8.93 lbs.; weight reciprocating part of connecting rod, 3.305 lbs.; total reciprocating weight per cylinder, 17.355 lbs.; weight per sq. in. piston area, .0538 lb.; length of connecting rod (centres), 310.0 mm. = 12.20 in.; ratio, connecting rod-crank throw, 3.445:1; inertia, lbs. sq. in. piston area, top centre, 137.0 lbs. sq. in.; inertia, lbs. sq. in. piston area, bottom centre, 75.5 lbs. sq. in.; inertia, lbs. sq. in. piston area, mean, 53.25 lbs. sq. in.; weight of rotating mass of connecting rod, 5.625 lbs.; total centrifugal pressure, 1,106 lbs.; centrifugal pressure, lbs. sq. in. piston area, 34.4 lbs. sq. in.; mean average fluid pressure, including compression, 48.0 lbs. sq. in.; mean average loading on crank-pin bearing, total from all sources in terms of lbs. sq. in. piston area, 118.0 lbs. sq. in.; diameter of crank-pin, 66.0 mm. = 2.598 in.; rubbing velocity, 15.85 ft. sec.; effective projected area of big end bearing, 43.23 sq. cm. = 6.70 sq. in.; ratio, piston area/projected area of big end bearing, 4.96:1; mean average loading on big end bearing, 85 lbs. sq. in.; load factor on big end bearing, 9,270 lbs. ft. sec.

**Cylinders.**—Over-all height of bare cylinder from top of base chamber, 479.5 mm. = 18.87 in.; depth of spigot at base of cylinder, 3.5 mm. = 0.137 in.; diameter of cylinder over water jacket, 185.0 mm. = 7.28 in.; valve centres (between inlet and exhaust), 63.0 mm. = 2.48 in.; thickness of flange at base of cylinders, 12.0 mm. = 0.47 in.; number of holding-down studs per cylinder, four; diameter of holding-down studs, 19.0 mm. = 0.74 in.; thickness of water jacket, 1.0 mm. = 0.039 in.; mean thickness of combustion chamber wall, 8.0 mm. = 0.31 in.; mean thickness of cylinder barrel, 3.0 mm. = 0.11 in.; tensile stress, 6,640 lbs. sq. in. (approx.) (assumed maximum pressure 450 lbs. sq. in.).

**Piston.**—Type of piston, cast-iron (flat crown); diameter at top, 164.25 mm. = 6.446 in.; diameter at bottom, 164.75 mm. = 6.486 in.; length, 151.00 mm. = 5.944 in.; ratio, piston length/cylinder bore, .914:1; number of rings per piston, three piston rings, one scraper ring; position of rings, all above gudgeon pin; width of rings, 6.5 mm. = 0.255 in.; gap of rings in cylinder, 1.39 mm. = 0.055 in.

**Connecting Rod.**—Length between centres, 310.0 mm. = 12.205 in.; ratio, connecting rod/crank throw, 3.44:1; little end bearing type, floating cast-iron bush; floating bush, diameter, inside, 38.0 mm. = 1.496 in.; floating bush, diameter, outside, 44.3 mm. = 1.743 in.; floating bush, effective length inside, 93.0 mm. = 3.661 in.; floating bush, projected

area of bearing on gudgeon pin, 35.35 sq. cm. = 5.48 sq. in.; ratio, piston area/projected area of little end bearings, 6.06:1; big end bearing: type, bronze shell lined white metal; big end bearing, diameter, 66.0 mm. = 2.598 in.; big end bearing, length (actual), 73.56 mm. = 2.893 in.; big end bearing, length (effective), 65.5 mm. = 2.580 in.; big end bearing, projected area, 43.23 sq. cm. = 6.70 sq. in.; ratio, piston area/projected area of big end bearing, 4.96:1; number of big end bolts, four; full diameter of bolts, 14.0 mm. = 0.551 in.; diameter at bottom of threads, 12.0 mm. = 0.472 in.; total cross sectional area, bottom of threads, 4.520 sq. cm. = 0.70 sq. in.; pitch of threads, 1.5 mm.; total load on bolts at 1,400 r.p.m., 5,824 lbs.; total load on bolts at 1,600 r.p.m., 7,602 lbs.; stress per sq. in. at 1,400 r.p.m., 8,320 lbs. sq. in.; stress per sq. in. at 1,600 r.p.m., 10,860 lbs. sq. in.

**Crankshaft.**—Number and type of main bearings, seven bronze shell lined white metal; cylinder centres, 187.0 mm. = 7.362 in.

**Crank-pins.**—Outside diameter, 66.0 mm. = 2.598 in.; inside diameter, 38.0 mm. = 1.496 in.; length, 74.0 mm. = 2.913 in.

**Journals.**—Outside diameter, 66.0 mm. = 2.598 in.; inside diameter, 36.0 mm. = 1.417 in.; length, propeller end, 67.0 mm. = 2.638 in.; length, rear end, 67.0 mm. = 2.638 in.; length, centre, 67.0 mm. = 2.638 in.; length, intermediate, 67.0 mm. = 2.638 in.

**Crank Webs.**—Width, 95.0 mm. = 3.740 in.; thickness, 23.0 mm. = 0.906 in.; radius at ends of journals and crank-pins, 4.5 mm. = 0.171 in.; weight of complete shaft, 99.9 lbs.

**Working Clearances.**—Piston clearance, top (total), 0.75 mm. = 0.029 in.; piston clearance, bottom (total), 0.25 mm. = 0.009 in.; side clearance of connecting rod in piston (total), 11.8 mm. = 0.464 in.; side clearance of big end on crank-pin (total), .44 mm. = .0173 in.; end clearance of crankshaft in main bearings, 3.0 mm. = 0.118 in.; clearance of valve stem in guide (inlet), 0.12 mm. = .00472 in.; clearance of valve stem in guide (exhaust), 0.15 mm. = .0059 in.

**Lubrication System.**—Number and type of oil pumps, three, rotary gear; oil consumption per hour, 11.0 pints; oil consumption per b.h.p. hour, 0.937 pints; oil temperature, 65° C.; oil pressure, 5.0 lbs. per sq. in.; specific gravity of oil, 0.899 s.p.g.; ratio pump speed/crankshaft speed, 1:2; pump delivery (calculated at 100 per cent. volumetric efficiency), 91 gallons per hour at normal engine revs.

**Ignition.**—Number and type of magnetos, two Bosch; firing sequence of engine, 1-5-3-6-2-4; ignition timing (fully advanced), 38° early; number of plugs per cylinder, two; type of plugs, Bosch 3 point; ratio, magneto speed/engine speed, 1.5:1.

## Mechanical Tests.

Mechanical tests were made on the crankcase and crankshaft, the results of which are given below:—

Crankcase.									
Mark.	Diam.	Max. Stress.		Elongation, %.					
T	0.253	11.65		1					
L	0.254	11.28		1					
Crankshaft.									
Position.	Diam.	Mark.	Yield Stress, Tons/sq. in.	Max. Stress, Tons/sq. in.	p.c. Elong. on 4A.	R. of A., %	Impact, Ft. lbs.		
End ..	1	.254	59.0	63.1	14.3	56.3	17.21		
Journal ..	2	.254							
Web ..	3	.254	61.6	64.1	15.1	54.6	16.121		
Long. ..	4								
Crank-pin, long.	5	.254	63.6	67.1	15.1	55.7	12.12		
	6								
Web, trans.	7	.254	61.4	65.3	7.2	10.5	5.5		

## Metallurgical Analysis of Principal Parts.

	Carbon.	Graphite Carbon.	Combined Carbon.	Silicon.	Manganese.	Sulphur.	Phosphorus.	Nickel.	Chromium.
	%	%	%	%	%	%	%	%	%
Cylinder head	0.49	2.57	0.91	1.60	0.70	0.131	0.34		
Cylinder barrel				0.33	1.01	0.028	0.054		
Cylinder water-jacket ..	0.25			0.27	0.63	0.032	0.037		
Piston ..		2.42	0.83	1.29	0.83	0.111	0.30		
Gudgeon pin floating bush		2.39	0.65	1.43	0.76	0.146	0.47		
Gudgeon pin ..	0.28			0.23	0.48	0.028	0.022		
Connecting rod ..	0.15			0.33	0.31	0.027	0.010	1.42	0.49
Inlet valve ..	0.53			0.30	0.48	0.032	0.044	4.01	0.51
Exhaust valve ..	0.10			0.20	0.26	0.019	0.023	3.62	1.16
Crankshaft ..	0.31			0.31	0.63	0.030	0.015	4.01	0.83
Camshaft ..	0.40			0.25	0.23	0.022	0.040	3.46	0.68
Camcore ..	0.17			0.23	0.75	0.036	0.041	0.47	
Big-end bearing metal	3.51	80.05		6.34		9.90			
Main journal bearing ..	0.92		77.65	10.00		11.18			
Crankcase ..	0.99		0.87	12.01		Alu- minium (by Diff.) 86.57	0.56	trace	

## General Analysis of Weights.

Description of Part.	No. per set.	Average unit in lbs.	Weight of complete set in lbs.	Percentage of total weight.
Cylinders, bare ..	6	32.75	196.50	21.59
Pistons, complete with rings and gudgeon pin set screws	6	12.30	73.80	8.11
Gudgeon pins ..	6	1.75	10.50	1.15
Connecting rods and floating bushes ..	6	8.93	49.12	5.39
Crankshaft, with oil rings ..	1	99.90	99.90	10.98
Crankshaft extender, nut and pin	1	4.00	4.00	0.44
Inlet valves ..	12	0.43	5.25	0.57
Exhaust valves ..	12	0.47	5.70	0.62
Inlet and exhaust valve springs	24	0.28	6.74	0.74
Inlet and exhaust valve collars, cotters and locking device	24	0.12	3.00	0.32
Thrust, with ball races, propeller hub flange, and camshaft driving sprocket	1	17.68	17.68	1.94
Camshafts ..	2	10.00	20.00	2.20
Overhead valverockers, complete	12	1.08	12.99	1.42
Overhead rocker bearings ..	24	0.42	10.50	1.15
Valve tappets and guides ..	12	0.93	11.25	1.23
Crankcase, top half ..	1	94.30	94.30	10.36
Crankcase, bottom half ..	1	41.32	41.32	4.54
Bearing caps ..	6	2.68	16.12	1.77
Front bearing cap ..	1	5.56	5.56	0.61
Crankcase holding-down bolts, clamps, nuts and washers ..	14	2.40	33.60	3.70
Induction pipe, complete ..	1	9.09	9.09	1.00
Propeller hub, bolts and nuts	1	21.00	21.00	2.30
Inlet valve push rods ..	6	0.48	2.90	0.32
Exhaust valve push rods ..	6	0.49	2.97	0.33
Inlet and exhaust stiffening plates	2	2.00	4.00	0.44
Oil pumps, drive and pipe ..	1	9.00	9.00	0.98
Rear cover plate ..	1	6.06	6.06	0.66
Front cover plate ..	1	4.00	4.00	0.44
Water pump, complete ..	1	8.50	8.50	0.93
Camshaft, oil and water pumps driving gears ..	1	13.65	13.65	1.50
Wireless clutch ..	1	5.06	5.06	0.55
Revolution counter gear ..	1	2.62	2.62	0.28
Machine gun interrupter gear ..	1	1.82	1.82	0.20
Petrol pump ..	1	3.50	3.50	0.38
Magnetos ..	2	10.75	21.50	2.36
Magneto wiring ..	1	4.75	4.75	0.52
Oil pipes ..	1	4.00	4.00	0.44
Self-starter gear ..	1	6.00	6.00	0.66
Exhaust manifold ..	1	27.00	27.00	2.96
Carburettors ..	2	16.00	32.00	3.51
Miscellaneous ..			3.75	0.41
Total weight of engine—			911.00	100.00

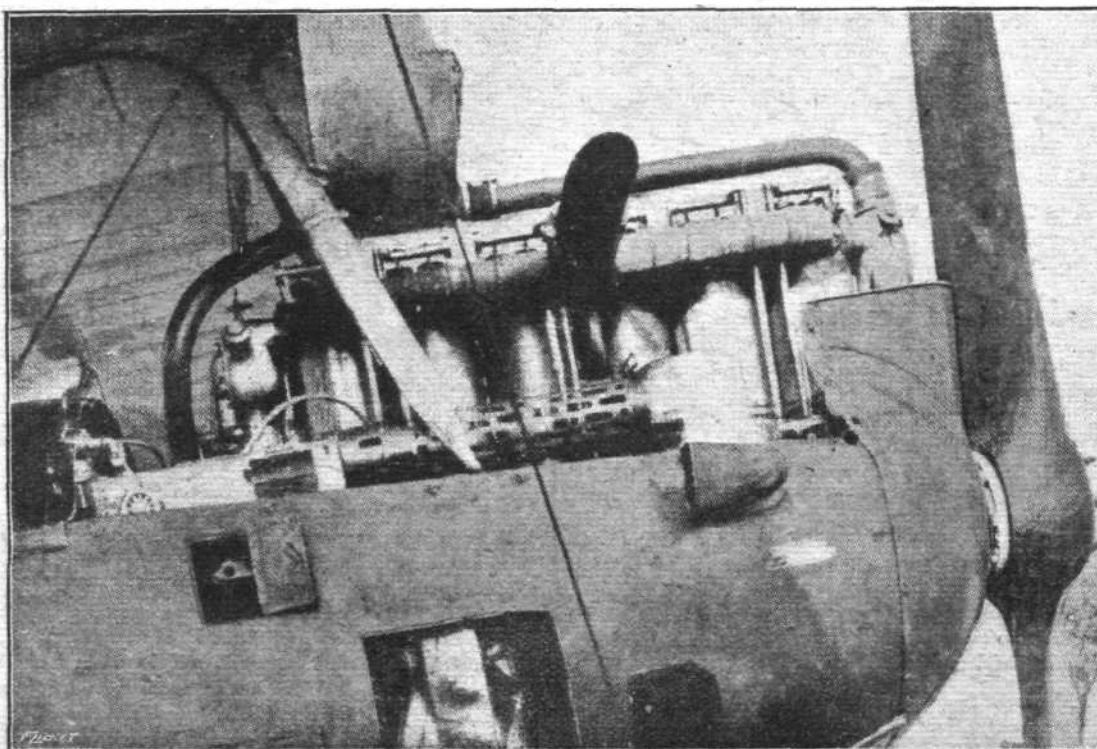


Fig. 48.—The 300 h.p. Maybach engine, installed in the Rumpler C.4 biplane.



**Cooling System.**—Number and type of water pumps, one centrifugal; diameter of inlet pipe, 54.0 mm. = 2.126 in.; diameter of outlet pipe, 50.0 mm. = 1.966 in.; diameter of rotor, 111.0 mm. = 4.36 in.; water capacity of one cylinder, 1,284.0 cu. cm.; number and type of radiators, one, semi-circular honeycomb; ratio, water pump speed/engine speed, 2:1; water temperature, inlet, 57° C.; water temperature, outlet, 68° C.

**Petrol Pump.**—Number and type of petrol pumps, one Maybach, double acting; bore, 15.0 mm. = 0.59 in.; stroke, 17 mm. = 0.66 in.; normal delivery, 264 pints per hour at 800 r.p.m.; maximum delivery, 630 pints per

hour at 1,275 r.p.m.; ratio, pump speed/crankshaft speed 1:2.

**Weights.**—Weight of complete engine, dry, with propeller boss and exhaust manifold, 911 lbs.; weight per b.h.p., ditto, 3.10 lbs.; weight of fuel per hour, 139 lbs.; weight of oil per hour (s.p.g. .899), 12.36 lbs.; total weight of fuel and oil per hour, 151.30 lbs.; gross weight of engine in running order, less fuel and oil (cooling system at .65 lb. per b.h.p.), 1,102.0 lbs.; weight per b.h.p., ditto, 3.79 lbs.; gross weight of engine in running order, with fuel and oil for six hours (tankage at 10 per cent. weight of fuel and oil), 2,100.9 lbs.; weight per b.h.p., ditto, 7.14 lbs.

# THE ROLL OF HONOUR

(When an Officer is seconded from the Army, his unit is shown in brackets.)  
Published September 18th.

## Killed.

Greenwell, Lieut. J. E. Lec, Lieut. W. (R. Ir. F.).  
Hunt, Lieut. D. R. Yeulett, Lieut. W. A.

## Previously reported Wounded, now reported Killed.

Driscoll, Lieut. D. O'Neil (M dd'x.). Twohey, P.F.O. W.F.

## Previously Missing, now reported Killed.

Helmert, Lieut. E. W. Thompson, Sec. Lieut. L.  
Thompson, Sec. Lieut. H.

## Died of Wounds.

Oertling, Lieut. L. J. F.

## Drowned.

Porter, Lieut. E. M.

## Cadets Killed.

Buchanan, I. F. Kaplan, H. Thompson, S.  
Cook, F. R. Talbot, C. D. White, G. J.

## Wounded.

Barter, Sec. Lieut. A. K., D.F.C. Gompertz, Sec. Lieut. H. C. T.  
Bulman, Sec. Lieut. T. S. (R.F.A.).  
Caton, Sec. Lieut. F. Marshall, Sec. Lieut. J. W.  
Child, Sec. Lieut. V. L. Purvis, Lieut. M. C.  
Dewhurst, Sec. Lieut. A. (W. Yorks.). Roberts, Capt. G. G.  
Gyles, Sec. Lieut. P. F. Turner, Sec. Lieut. C. E.

## Missing.

Ambler, Lieut. J. J. (North'd. F.). Kinton, Lieut. C. E. (Nova Sco.).  
Collins, Lieut. V. St. B. Laing, Sec. Lieut. T. H.  
Corkery, Sec. Lieut. J. P. Living, Sec. Lieut. C. H.  
Dennitts, Sec. Lieut. K. J. W. McCulloch, Sec. Lieut. I. M.  
Dowling, Capt. B. L. Macfarland, Lieut. F. M.  
Ferrand, Maj. J. B. P. Mackereth, Capt. J.  
George, Lieut. I. F. Myring, Sec. Lieut. T. F. L.  
Gormley, Sec. Lieut. A. J. C. O'Connell, Lieut. O.  
Hickes, Sec. Lieut. R. I. A. Papworth, Sec. Lieut. A. S.  
Ingram, Sec. Lieut. R. T. Perry, Sec. Lieut. L. P.  
Jonsson, Lieut. H., M.C. (Brit. Col.). Peterson, Sec. Lieut. A. (E. Yorks.).  
Jones, Sec. Lieut. T. A. Preston, Sec. Lieut. A.

## Previously Missing, now reported Prisoner in German hands.

Cyr, Lieut. A. J. (Can. For. C.).

Published September 19th.

## Killed.

Bullock, Sec. Lieut. R. H. Lygo, Lieut. F. A.  
Hofmeister, Sec. Lieut. A. W. Page, Capt. L. S. M. (R. E. Kent)  
Hopkinson, Col. B. Yeo.).  
Hummerstone, Lieut. L. G. (Lond.) Tanner, Capt. J. C.  
(T.F.). Taylor, Capt. A. D.

## Died of Wounds.

Baldwin, Sec. Lieut. W. E. (Manch.). Neilson, Sec. Lieut. A. A.

## Drowned.

Fletcher, Sec. Lieut. E. C.

## Cadets Killed.

Langbeck, H. Phillips, C. H. Sneddon, F. E. K.  
McHenry, C. F. Roe, F. Weaver, E. J.

## Wounded.

Barrington, Lieut. E. L., M.C. McKinnie, Sec. Lieut. H. T.  
Clayson, Sec. Lieut. P. A. Miller, Lieut. W. N. (North'd. F.).  
Dobing, Sec. Lieut. H. Schofield, Sec. Lieut. J. N.  
Dykes, Capt. G. H. (Lan. F.). Scott, Capt. G. J. (R.F.A. (T.F.)).  
Greenaway, Sec. Lieut. W. G., M.C. Sifton, Lieut. T. G.  
(R. Ir. Fus.). Snyder, Lieut. V. G.  
Lyon-Hall, Sec. Lieut. E. H. Trundle, Sec. Lieut. G. M.  
King, Lieut. A. H. E.

## Missing.

Beesley, Sec. Lieut. R. McPhee, Lieut. R.  
Boyle, Sec. Lieut. J. C. Miller, Sec. Lieut. A. M.  
Eaton, Sec. Lieut. F. C. B. Oliver, Sec. Lieut. T. K. G.  
Fellowes, Lieut. H. V. Pacey, Sec. Lieut. F. C.  
Fergusson, Lieut. F. W. Penrose, Sec. Lieut. K.  
Flynn, Capt. H. L. W. Player, Sec. Lieut. F.  
Forman, Capt. J. H. Spilhaus, Lieut. J. A.  
Gammell, Lieut. B. E. Sproule, Lieut. E. R. L.  
Gilbertson, Lieut. D. H. S. Stahl, Sec. Lieut. A. M.  
Gower, Lieut. J. L. Stock, Sec. Lieut. A. E.  
Hall, Sec. Lieut. W. E. Swayze, Lieut. W. K.  
Hogg, Lieut. W. G. Vickers, Sec. Lieut. A.  
Hughes, Sec. Lieut. R. D. Washington, Sec. Lieut. W. F.  
Killick, Sec. Lieut. C. H. P.

Published September 20th.

## Killed.

Bell, Sec. Lieut. O. Lee, Sec. Lieut. J. A.  
Box, Lieut. G. H., D.F.C. Lyne, Lieut. E., jun.  
Boyd, Lieut. H. Reid, Sec. Lieut. D. S.  
Houston, Sec. Lieut. W. D. Window, Sec. Lieut. K. P.  
Inches, Lieut. R. K.

## Died of Wounds.

Carter, Maj. A. R. (R.G.A.) Hilborn, Capt. W. C.

## Cadets Killed.

Spooner, A. B. Willis, A. E.  
Tinker, A. Winchester, P. G. D.

## Wounded.

Aldred, Sec. Lieut. W. B. McPhail, Sec. Lieut. J. W. R.  
Anderson, Lieut. G. Nattrass, Sec. Lieut. H.  
Collins, Lieut. A. V. (K.L.R.). Pryke, Sec. Lieut. A. G. (R. Berks.).  
Fair, Sec. Lieut. V. A. (K.R.R.C.). Roberts, Lieut. C.  
Harrington, Sec. Lieut. J. Rushforth, Capt. H. P.  
Lawson, Lieut. F. A. (R.W.F.). Talbot, Lieut. J.  
Lovett, Sec. Lieut. G. Tearle, Sec. Lieut. L. G.  
Lowthian, Sec. Lieut. L. I.

## Missing.

Bateman, Lieut. E. C. McGill, Lieut. J. A.  
Bugg, Sec. Lieut. E. G. Mellor, Lieut. D. J. T.  
Coleman, Sec. Lieut. C. M. Platt, Lieut. A.  
Doyle, Capt. J. E. Seymour, Sec. Lieut. C. B.  
Good, Lieut. H. B. Thatcher, Sec. Lieut. A. R.  
Harley, Lieut. V. Thomson, Sec. Lieut. S. A.  
Hiscox, Sec. Lieut. A. H. Underwood, Sec. Lieut. E. N.  
Holland, Lieut. E. V. Walker, Sec. Lieut. J. C.  
Howarth, Capt. N. Wells, Capt. G. A.

Published September 21st.

## Killed.

Bach, Sec. Lieut. E. L. King, Capt. C.  
Barlow, Sec. Lieut. H. F. McCallum, Lieut. A. R.  
Bartlett, Capt. M. Querrie, Sec. Lieut. H. W.  
Dinwoodie, Sec. Lieut. G. S. (H.L.I.). Righton, Lieut. W.  
Kidd, Sec. Lieut. V. M. Sellar, Sec. Lieut. W. R.

## Previously Missing, now reported Killed.

Dickens, Lieut. M. W. (R.F.C.).

## Died of Wounds.

Sheridan, Sec. Lieut. C. J. C.

## Cadets Killed.

Doney, C. A. Hill, H. Parr, D. A.  
Gorman, D. W. Lomax, C.

## Previously Missing, now reported Wounded and Prisoner.

Austin, Lieut. H.

## Missing.

Sellers, Lieut. F. M. (R. Newf.).

## Previously Missing, now reported Prisoners.

Bingham, Lieut. A. E. Michell, Lieut. P. C.  
Burn, Sec. Lieut. J. S. Penruddocke, Lieut. N. F. (A.S.C.).  
Garrett, Sec. Lieut. B. N. Smith, Lieut. A. (Linc. R.).  
Hinchliffe, Sec. Lieut. H. E. (Manch.). Thompson, Lieut. J. W.  
Ingram, Sec. Lieut. L. J. W. Van Tilburg, Sec. Lieut. J. A.  
Mallett, Sec. Lieut. D. Vosper, Lieut. R. A.

## Previously Missing, believed Prisoners, now reported Prisoner

Cross, Sec. Lieut. H. L. Marshall, Sec. Lieut. N. H.

Published September 22nd.

## Killed.

Alsford, Sec. Lieut. H. E. Herring, Sec. Lieut. G. E.  
Brindley, Sec. Lieut. V. G. MacDonald, Sec. Lieut. B. J.  
Crombie, Lieut. W. C., M.C. Ruxton, Lieut. W. H. (R. Ir. R.).  
Cunningham, Sec. Lieut. P. J. Stevens, Sec. Lieut. H. K.  
Daniel, Lieut. A. H. R. Young, Sec. Lieut. F. R.  
Halley, Sec. Lieut., D. B.

## Previously Missing, now reported Killed.

Jonsson, Lieut. H., M.C. (Brit. Col.).

## Wounded.

Bradnam, Lieut. C. A. Kelsey, Lieut. P. J.  
Gye, Capt. J. A. Russell, Sec. Lieut., J. D.  
Judge, Lieut. G. R.

## Missing.

Broadbent, Lieut. G. Sabey, Sec. Lieut. A. R.  
Courtney, Sec. Lieut. W. E. L. Smailes, Sec. Lieut. E. B.  
Dunn, Lieut. M. A. Toy, Sec. Lieut. E. C.  
Henry, Lieut. R. A. (R.G.A.). Wooding, Sec. Lieut. J.  
Kemp, Sec. Lieut. J. E.

## Correction.

Cullington, Sec. Lieut. A. W., reported Missing, should read Wounded.

Published September 24th.

## Killed.

Partington, Lieut. C. Walker, Sec. Lieut. J. G.  
Russell, Sec. Lieut. C. G. Zeally, Lieut. E. R. (R. Lancs.).  
Shedel, Capt. W. G. (R. Fus.).

## Died of Wounds.

McQueen, Sec. Lieut. H. J. Quinton, Sec. Lieut. J. G.  
Mills, Sec. Lieut. W. J. (North'd. F.). Thorp, Sec. Lieut. C. E.

## Previously Missing, now reported Died of Wounds as Prisoner in German hands.

Maasdrop, Lieut. C. R. (R.F.C.).

## Missing, believed Killed.

Kane, Lieut. A. G. (S. Wales B.).

# AIRISMS FROM THE FOUR WINDS

YOUNG America seems to take to the air as the proverbial duckling does to water. We quote from the letter of a newly-made pilot in France to his home folks in New York:—

"Feeling a bit coltish, I went on over the château, dropped low over the beautiful Corot forest, and came back. Looking down I could see the backwash of my prop. waving the trees.

"Zooming is great fun, and I tried it some more. Technically it is 'contour-flying,' and is strictly *defendu* for such as me. I know I shall be ruined for anything else from now on. In Middle Tennessee they say if you teach a horse to jump fences he is no good after that because he likes it too well.

"I dipped into the valley, picking up speed all the way. I headed straight for some tall Normandy poplars, and actually I climbed them, or rather jumped them. After that I zoomed every lone tree in a field, and hopped every hedge, although, in fact, it was getting so dark that it was risky. I went down to speak to every farmhouse, and when the barnyard fowl began to run for cover I would shoot up into the sky again.

"It is as different from ordinary flying as riding an Indian or a Harley-Davidson is from motoring, only it is a hundred thousand times more thrilling than motor-biking. It is smooth like motor boating and you have the same wave motion, and the sensation of rushing movement. It is more thrilling than aqua-planing, that kingly sport, consisting of being towed on a board behind a fast motor boat. It partakes of the elements of all these.

"The ground flows past in a magnificent stream. Flying at an altitude is like floating, and if it were not for the beauty of the clouds above and landscape below it would be monotonous; but not so with flying low, where one has to be alert and quick. Don't worry, I won't do it too often—I can't afford to take the chance when I am needed up at the front."

We had an opportunity recently of a talk with an officer who is perhaps best known to the public by his pen-name, "Boyd Cable," and were greatly interested to hear from him some account of the good work he is doing for the aircraft workers, and, through them, for the whole Air Force.

It appears that a year or more ago Boyd Cable, who has been at the Front since 1914, was asked by the Air Board to come over to England for a few weeks and give some short talks to the workers in selected aircraft factories, telling them of air work at the Front and how their productions were being used.

The first trip, to which in the past reference has been made in these pages, was such a success and was so enthusiastically received by workers and managements that Boyd Cable was immediately asked to repeat it, and has since made several journeys over from the Front and round the factories.

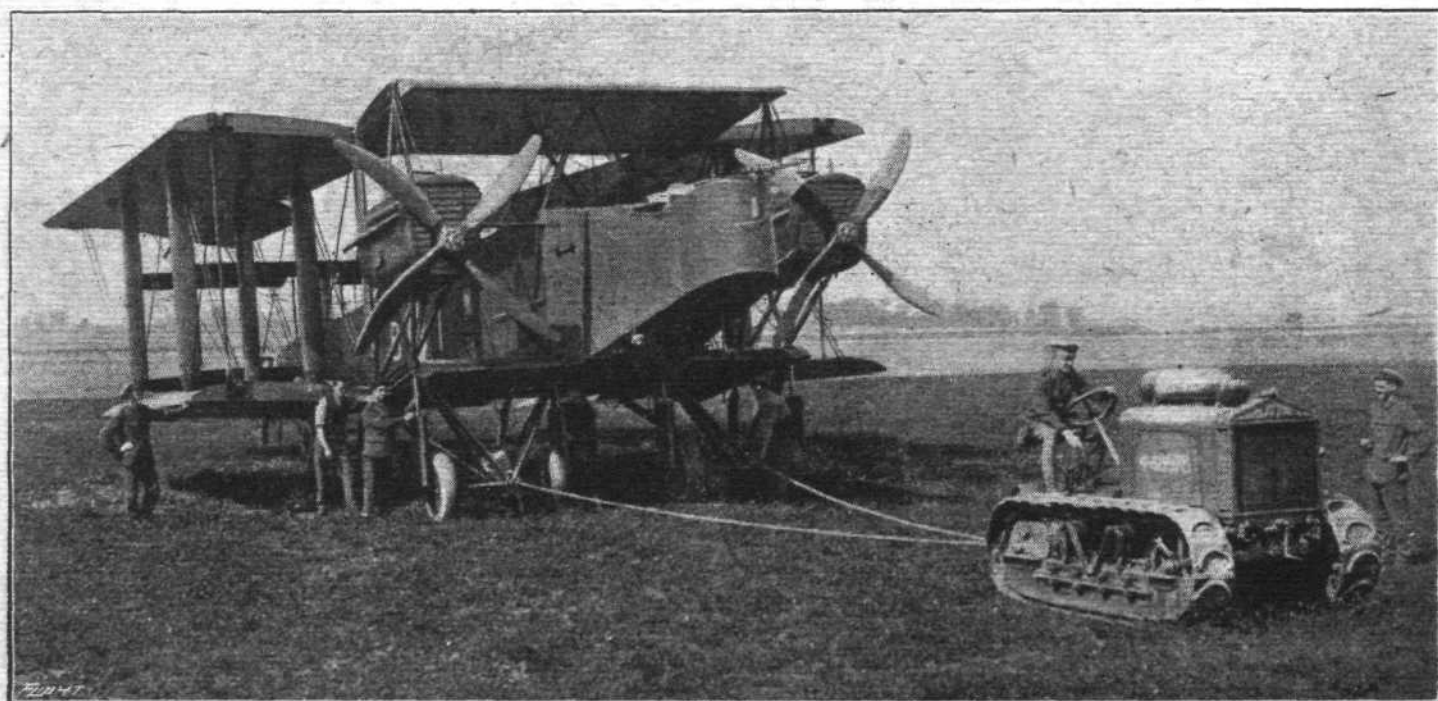
Out of his meetings with the workers he came to realise the great need for spreading such information as he could give, and has since been given permission to extend his activities in several ways. Perhaps the most appreciated of these is in the letters he writes from the Front to various factories, keeping them in personal touch with the work of their productions and of the Air Force. Being in the Field and with the squadrons there himself, he is able to gather interesting and accurate information of all sorts of fights and incidents concerning the various types of machines, engines, magnetos and parts.

Occasionally he picks up in France portions of crashed enemy machines, and sends these home to the factories. When he finds a machine captured intact he gets permission, if possible, to have it sent on exhibition to the factory which built the machine and engine flown by our victorious pilot, and writes the factory telling them the story of the combat.

Lately he obtained permission for an artist to go to the Front, and, from the descriptions of participants, to make pictures of fights and so on. These pictures are published in leading journals, and the factories concerned are then given the opportunity of purchasing prints at cost price.

THE whole of Boyd Cable's work aims at interesting the aircraft workers, telling them how their productions figure in action, and impressing on them the urgent need of the best possible output in quality and quantity, and only those who know the soul-killing monotony of repetition work will properly appreciate the good work he is doing. Certainly both the workers themselves and the managements of the firms do, as the letters he constantly receives from both bear witness. It is a pity that similar work has not and is not being done for all kinds of munition workers.

Now comes a very important item to note:—If any aircraft factory with which Boyd Cable is not in touch cares to be included in any of his plans for informing the workers, we shall be glad to pass on any letter from them sent to him through us.



Ministry of Information.

Getting an R.A.F. "baby" bomber into position in an aerodrome on the British Western front in France



MR. HERBERT BAILEY, a war correspondent with the Americans at the South end of the French line of battle, gives a graphic pen picture in the *Daily Mail* of the start by the Americans of their own air-offensive in support of their troops. "The Germans," Mr. Bailey says, "in their St. Mihiel retreat used two main roads. The Americans closed one of these to the enemy, and his sole avenue of escape was the road from St. Benoit to Woel. Congested transport, troops and guns were struggling along this road, when there suddenly appeared 150 American airmen carrying small bombs and 500 rounds of ammunition each.

"Swooping down on the road they pelted bombs and bullets. Horses fell, men ran for their lives, wagons disappeared in flames, and all that was left was a jumbled mass. It was this that enabled the Yanks to make a greater haul."

AND presently the "Yanks" will really get going with their aerial methods.

At the Mendoza Galleries in Old Bond Street, where some wonderful Italian war photographs are on exhibition, under the auspices of the Italian Foreign Action Bureau, not the least interesting is an enlargement of Vienna from above, taken from Major d'Annunzio's aeroplane, with the leaflets dropping around as thick as a miniature snow-storm. No fog about that picture whatever there was over Vienna!

THE All-Highest should be in good favour with metal workers—especially Christian workers—having regard to his expertness in camouflaging spelter as gold, when being over-generous with thousand to ten thousand pound (sterling) gold trophies! It's no wonder therefore he has sent a telegram to the Christian Metal Workers' Union, in which, according to an Essen telegram to the *Lokalanzeiger*, he expressed his gratification at their avowal of unshakable and staunch loyalty to the Emperor and the Empire, and his confidence that, "with God's help, the united strong will of the entire German people, ready for any sacrifice, would accomplish the attainment of a happy and free future."

Just so, about as spurious as the All-Liest's trophies.

SEA-BOAT shrimping seems a possible post-war pastime, judging by the seaplane accident reported to have occurred off the East Coast last Thursday. When flying low a machine caught the mast and sail of a shrimp boat engaged in fishing. The seaplane, in attempting to rise, lifted the sailing craft out of the water, but the mast and shroud plate broke, and the boat settled again on her keel. The owner, the only man on board, escaped injury, and the pilot of the seaplane, which was disabled, was rescued by another shrimp-boat. No information is available as to the fate of the shrimps.

Not the least of the horrors of war is that that ghastly anomaly, the "descriptive" piece, has been extended to include imitations of Zeppelin raids, with concomitant bomb-droppings (bass drum) and machine guns (fury of kettle-drums). As music, this effort of Mr. Howard Carr's, which was recently given a hearing at a promenade concert, is only one degree removed from "Dawn in the Farm Yard," as given in the L.C.C. parks, to the great glee of the young, who salute the cock-crowing with delighted shrieks. Surely British composers can do better than this—music should induce emotion, and not crudely imitate effects.

YET another "Flying Sonnet" has been unearthed by a correspondent of the *Times*, the Countess Martinengo Cesaresco, which was written by the courtly rake, Luigi Tansillo (circa 1535):—

Poi che spiegat'ho l'ai al bel desio  
Quanto più sott' il pie' l'aria mi scorgo  
Più le veloci penne al vento porgo,  
Et spreggio il mondo et vers' il ciel m'invio.  
Nè del figiuol de Dedalo il fin rio  
Fa che giù pieghi, anzi vie più risorgo;  
Che cadrò morto a terra ben m'accorgo  
Ma qual vita pareggia al morir mio?  
La voce del mio cor per l'aria sento:  
Dove mi porti temerario? China,  
Che raro è senza duol tropp' ardimento.  
Non temer, rispond'io, l'alta ruina,  
Fendi sicur le nubi, et muor contento  
S'il ciel si illustre morte ne destina.

An English version is appended:—

As on wide wings exultant through the air,  
The depths beneath unfold them to my gaze,  
With keener joy my pinions swift I raise  
And spurn the earth and boldly heavenwards fare.  
Nor any thought of Daedalus' sad care

Tempts me to swerve, as in the golden haze  
Onwards I soar, conscious without amaze  
Of hovering Death; for what life may compare  
With this my death? I hear the faint soul cry:  
"Return," she pleads, "dare not, too rash, the grave,  
"Nor nerve, nor art may, reckless, Fate defy."  
"Fear not," I answer, "the fell crash, nor brave.  
"Unshaken cleave the clouds, and happy die,  
"Should Heaven ordain us the proud death I crave."

Sir Sidney Lee, in an interesting addenda, quotes a further couplet by the same writer:—

Questi aspiro a le stelle, e s' ei non giunse,  
La vita venne men, ma non l'ardire.

which we may translate roughly:

"Who'd reach the stars, though losing his desire  
And life withal, did not in vain aspire."

WE notice Mr. Daniels, Secretary of the U.S. Navy, is reported, when speaking on Monday at the Eddystone Ammunition Corporation at Philadelphia, to have said that on his calendar in Washington there was recorded an engagement, of which the date was not yet set, to go with the Marine Band when it marches in the triumphal entry of General Pershing's victorious Army into Berlin.

We venture to express the hope that our powers that be will not be once again too late in making their application for permission to have, in this triumphal procession into the German capital, representatives of at least some of the units, including the R.A.F., which have been carrying on for the last four years or so, in saving civilisation from the Huns. These samples of the Allies' units, it could be understood, would of course have to take their chance of there being room left in Berlin, at the fag end of the procession, for them to squeeze in. They might anyway hope to get as far as the outskirts of the city for the final scenes. It's worth a try for, anyhow.

#### TEN YEARS AGO.

Excerpts from the "Auto." ("FLIGHT's" precursor and sister journal) of September, 1908. "FLIGHT" was founded at the latter end of 1908.

WILBUR WRIGHT FLIES FOR 19 MINS. 50 SECS.

Slowly, but surely, Mr. Wilbur Wright is creeping up to the French records of flight. One fine day he took out his machine, and modestly flew for 1 min. 42 secs. On the next day he flew for 3 mins. 43 secs., on the next day 6 mins. 56 secs., on the day afterwards for 8 mins. 13 secs. That was August 13th. On September 3rd he flew for 10 mins. 49 secs., and on September 5th for 19 mins. 50 secs.

DELAGRANGE-RECORDMAN DU MOND.

M. Delagrangé on Sunday morning last established new records. Up to Sunday morning Mr. Henry Farman had held the record for duration with a flight lasting 20 mins. 19½ secs., but when M. Delagrangé rose in the air at ten minutes to seven he remained aloft for 29 mins. 53½ secs., thereby improving upon Mr. Farman's flight by more than 9 mins. Naturally, with such an accomplishment, he also achieved a record distance, 24.727 kiloms.

THE "REPUBLIQUE" MAKES A RECORD.

On Saturday of last week, the new French military airship "Republique" established a record for closed circuit journeys, starting from and returning to the same headquarters. Leaving Chalais Meudon at ten minutes to nine in the morning with Maj. Voyer, Capt. Bois and a mechanic on board, a course was set in the direction of Paris, where it passed by the Eiffel Tower and over the Esplanade des Invalides en route for Belleville. Two hours after starting the "Republique" arrived at Senlis. The return journey was made over practically the same route as the outward run, and headquarters were reached at ten minutes past three, after a flight lasting 6 hours 20 mins., during which time a distance of about 125 miles was covered.

ORVILLE WRIGHT FLIES FOR 57 MINS. 31 SECS.

As we go to press, by cable we learn from Washington, U.S.A., that Orville Wright (Wilbur Wright's brother) has created, on Wednesday morning, the 9th inst., a marvellous new record for flying, by keeping in the air on his new aeroplane for no less a period than 57 mins. 31 secs., less than 2½ mins. under the hour. This extraordinary performance took place on the parade grounds at Fort Meyer, which Wright circled round at a speed of about 36 to 38 miles an hour, fifty-eight times in the presence of a number of officers of the Signal Corps of U.S.A. and a number of civilians.



# THE ADVISORY COMMITTEE FOR AERONAUTICS REPORT, 1917-1918.

THE following is the full text of the Annual Report of the Advisory Committee for Aeronautics which for the first time is addressed to the Right Honourable Lord Weir of Eastwood, Secretary of State for the R.A.F., instead of to the Prime Minister as heretofore:—

The Committee was appointed in the year 1909 by the Prime Minister to "advise in matters connected with the problem of flight, whether by means of aeroplanes or dirigibles," and has in former years reported accordingly to the Prime Minister. The Committee understands that it is desired that in future its report should be made to the Secretary of State for the R.A.F. In earlier years it was attempted in the report to give a brief but comprehensive review of the work accomplished in aeronautical research during the year, and to indicate the various directions in which material progress had been achieved; in present circumstances it is possible to do no more than outline the main subjects of investigation to which attention has been devoted, and the organisation which has been provided for dealing with the new problems which constantly arise.

Some changes have taken place in the *personnel* of the Committee during the year, related, for the most part, to appointments made in the organisation of the Air Ministry. Lt.-Col. J. G. Weir was nominated for membership on his appointment as Controller of the Technical Department. Major-General Brancker has recently been appointed a member on taking up the post of Comptroller-General of Aircraft Equipment. Major Hopkinson, Assistant Controller (Experiments) of the Technical Department, and Mr. E. C. Given, Director of Airship Production in the Admiralty Controller's Department, have also joined the Committee. Major-General Sir Godfrey Paine and Brig.-General D. Pitcher have retired from membership on relinquishing the positions held by them under the Air Board.

Much of the detailed work necessary to fulfil the functions assigned to the Committee is dealt with by Sub-Committees. An Internal Combustion Engine Sub-Committee, Sir Dugal Clerk, K.B.E., F.R.S. (chairman), and a Light Alloys Sub-Committee, Sir Henry Fowler, K.B.E. (chairman), were formed during the year 1916-17. An Aerodynamics Sub-Committee\* has since been constituted for the consideration in greater detail of special questions arising in connection with the aerodynamical section of the work. Other Sub-Committees are appointed from time to time to deal with particular problems. The work done by these Sub-Committees during the year under review is referred to below. The formation of these Sub-Committees and the general growth of the work has greatly increased the secretarial duties, and an Assistant Secretary has recently been appointed.

An Air Inventions Committee and an Accidents Committee were formed during the year by the Air Board before its dissolution on the establishment of the Air Ministry. It has been arranged that these Committees shall report monthly to the Advisory Committee as well as to the Air Ministry, that the advice and assistance of the Advisory Committee shall be obtained by them when needed, and generally that the same close co-operation shall be maintained between them and the Advisory Committee as exists between this Committee and its Sub-Committees. The Chairman of the Air Inventions Committee and of the Accidents Committee are members of the Advisory Committee, which is fully represented on those Committees. Some further particulars with regard to their work is given below.

Special attention has been directed towards maintaining and improving the close connection which is necessary between the experimental work directly controlled by the Committee and the investigations carried out on full-scale machines at the experimental stations established by the various branches of the Air Services. From the time of formation of the Committee the closest relations have been maintained with the Royal Aircraft Factory.† It has been arranged that full reports on matters of interest to the Committee shall be made by the other stations under the control of the Technical Department, and by the Admiralty Stations investigating airship and kite balloon problems. Members of the staff engaged in experimental work on models will

visit these stations, and will consult with the officers in charge of experiments as to the investigations required to correlate the model and full-scale work. Departmental officers also constantly visit the National Physical Laboratory to secure information as to work in progress, or to seek advice on current problems. The Committee has from the beginning made it a practice to visit from time to time the Service Air Stations engaged in experimental work. It is of opinion that this co-operation in experimental work is of the utmost importance, and is essential for securing continuous and substantial progress on a sound basis. The Committee receives the technical reports and papers issued by the Technical Department of the Department of Aircraft Production, as well as confidential information relative to the needs of the services and the supply of aeroplanes and engines, and these are also of great value and assistance.

Arrangements have been made with the Technical Department\* for the confidential issue to an approved list of arms, as well as to departmental officers, of the reports on experimental work carried out under the control of the Committee. In order that the information thus afforded may be made available as rapidly as possible, all such reports are now printed immediately after presentation to the Committee. It will be understood that caution must be exercised in the immediate application of these reports to problems of construction, since it is clearly impossible to eliminate all sources of error in presenting, month by month, instalments of a continuous research which would ordinarily extend over a lengthened period. It is thought, however, that valuable assistance will be rendered to constructors by acquainting them with the results of current work. The reports distributed, in addition to those submitted direct to the Main Committee, include also papers contributed to the Engine and Light Alloys Sub-Committees.

Assistance has been rendered by the Committee, through the Liaison Department of the Air Ministry, to the Air Services of our Allies. A large number of requests have been received for information as to the methods of experiment employed at the National Physical Laboratory and as to data obtained, as well as generally for advice and assistance. Plans of the Laboratory channels and particulars relative to the results of experimental work have been supplied. Members of French, Italian and American Commissions have visited the Laboratory, and have discussed with the Director and the Staff numerous matters in connection with the various branches of the work.

There has been no diminution in the number and complexity of the problems with which the Committee has been required to deal. Owing to the war the technical development of aeronautics has been extraordinarily rapid. The feats that are now performed in the air, and the capabilities of modern machines, are remarkable when it is remembered that it is very little more than ten years since the brothers Wright made their first flights in Europe. It requires little imagination, however, to realise that much greater developments are to be expected, and the competition of modern warfare renders it vital that the highest possible rate of progress should be maintained and that development should be pushed forward with the utmost speed. It is by no means easy to decide upon the method of attack best calculated to win ground quickly. The needs of the moment are in many cases imperative; immediate difficulties must be solved in order that construction may not be hampered and that supplies for the services may not be held up. It is, however, not less important to take a long view, and to secure the substantial improvements that are more likely to result from systematic and continuous research. The need of systematic investigation in this or that direction is being continually impressed upon the Committee by the questions with which it is confronted. To render it possible to carry out such continuous investigation quickly and at the same time to meet immediate needs, it is necessary to multiply facilities for experiment, and the Committee has had again to press for increased provision for experimental work. Happily, the fundamental importance of such research in connection with aeronautics is well established and undisputed, and as on previous occasions the needs urged by the Committee have been fully realised by the executive authorities, and their proposals have been strongly supported and carried through with the least possible delay. A channel for model tests is available at the Royal Aircraft Establishment, and this is being

\* Professor J. E. Petavel, F.R.S. (Chairman); Mr. F. W. Lanchester, M.Inst.C.E.; Lieut.-Col. Mervyn O'Gorman, C.B.; Major B. Hopkinson, C.M.G., F.R.S.; Mr. L. Bairstow, C.B.E., F.R.S., and Wing-Comdr. the Master of Sempill, of the Air Ministry; Dr. T. E. Stanton, F.R.S., and Mr. E. F. Relf, A.R.C.S., of the National Physical Laboratory; Capt. W. S. Farren, M.B.E.; with the Chairman of the Advisory Committee for Aeronautics (*ex-officio*).

† Now the Royal Aircraft Establishment.

‡ These reports are issued by Section T.5 of the Directorate of Air Technical Services, Royal College of Science, South Kensington, S.W.



employed, as far as possible, for specially urgent work. The Committee are glad to note also that many firms in this country have recognised the value of experiments on models in relation to design, and have constructed wind channels for their own use; a number of requests for details of the National Physical Laboratory channels have been responded to within the past year.

**Equipment for Experimental Work at the National Physical Laboratory.**—As above indicated, proposals for additions to the buildings and equipment for experimental work at the National Physical Laboratory have recently been made; the construction of these is in hand, and will, it is hoped, be completed at an early date. Two new channels are to be provided, one similar to the existing 7-ft. channels and one of special type. The design which has been adopted for the latter has been completely worked out by experiments on model channels, and while based on the same principle as was applied in designing the earlier channels, exhibits some interesting modifications in detail, which may be found generally valuable in future in channel construction. The buildings to be provided will contain also additional workshop and office accommodation.

Modifications of the existing equipment made during the past year embody the results of experience as regards the most accurate and the most expeditious methods of conducting the experiments. New methods have been perfected for measuring the drag on models in cases where this is very small and where consequently the highest accuracy is necessary if the results are to be of value, especially when a considerable change of scale is involved in passing from the model to the full-sized aircraft. Special apparatus has been designed for vertical force measurements, and for experiments on propellers and propeller interference. New apparatus has been constructed for the determination of rotary derivatives. Improvements have been introduced in existing methods of measurement, and every effort has been made to secure ease and rapidity of working, consistently with the maintenance of the requisite accuracy. In the Engineering Section special apparatus has been constructed for dealing with particular problems, among which may be mentioned the apparatus for impact tests at high temperatures of specimens of aluminium alloys.

**Experimental Work in Aerodynamics.**—In April, 1917, a Sub-Committee was appointed to consider the relation between full scale and model results, and to examine into certain special questions which appeared to present difficulty. This Sub-Committee held 11 meetings and received 31 special reports. In the course of their investigations they found it necessary to arrange for a considerable amount of experimental work both at the National Physical Laboratory and at the Royal Aircraft Establishment, while valuable assistance was also derived from reports made of the performance tests at other air stations. The information available was not sufficient to enable general conclusions to be reached as to scale effect, for which investigation extending over a long period will doubtless be necessary, but the results brought out were of great interest, and to a large extent cleared up existing difficulties. The Sub-Committee reported in December, 1917, and their report will shortly be ready for issue among the confidential papers of the Advisory Committee circulated by the Technical Department (T. 5). Following a recommendation made by this Sub-Committee, the Aerodynamics Sub-Committee, to which reference has already been made, was appointed in the same month and now sits regularly for the discussion of aerodynamics problems of special importance which arise in relation to aircraft. This Sub-Committee includes among its members representatives of the Technical Department and of the Services as well as of the National Physical Laboratory and the Royal Aircraft Establishment. Reports will be submitted to them of experimental work carried out at Service Air Stations, and arrangements have been made for securing the attendance at meetings of the officers in charge of such experimental work, in order that the Sub-Committee may have the fullest possible information on the matters dealt with.

A large amount of interesting and valuable work has been carried out during the year both at the National Physical Laboratory and at the Royal Aircraft Establishment, but it is not now proposed to give any detailed summary of investigations completed. The experiments have ranged over the whole field of practical aeronautics, including tests relating to aeroplanes, airships, kite balloons, propellers, radiators, wind screens for aircraft, aeroplane carrying ships, bomb dropping, pressure distribution, stability, &c. A considerable number of experiments have been made on models of complete aeroplanes, and the work done for the Scale Effect Sub-Committee included an analysis of the resistance of a complete model and comparison of the whole

resistance with the sum of the resistances of the component parts. The investigations relating to propellers have been of special value and importance. The question of flight at high altitudes has received attention. In existing circumstances it has not been possible to concentrate attention on general aerodynamical theory, but some consideration has necessarily been given to general questions arising in connection with the experimental work, and the study of eddy motion has been advanced.

The Air Ministry has formed a special Committee to investigate certain questions relating to airscrew design. Dr. Stanton, the Superintendent of the Aerodynamics and Engineering Departments at the National Physical Laboratory, is a member of this Committee, and experiments to obtain information desired by the Committee will be carried out at the Laboratory.

**Strength of Construction.**—Continued attention has been given to questions connected with strength of construction. Early in the year a series of calculations was carried out for various enemy machines to investigate the factor of safety allowed in German design. It is of interest to note that the conclusion resulting from these calculations was that neither in performance nor in strength were the German machines equal to the British. Other things remaining the same, an increase in the factor of safety necessarily involves some reduction in performance and manœuvring power, which, not less than strength, are of vital importance for safety in air fighting; it is clear, however, that the strength factor adopted in British design, which has in earlier years been the subject of much careful consideration by the Committee, has been wisely maintained at a high level. Specific questions relating to strength have arisen, chiefly in connection with engines, and propellers in relation to engines, and have been dealt with by the Engine Sub-Committee. Valuable papers relating to methods of stress calculation and measurement have been received from both the National Physical Laboratory and the Royal Aircraft Establishment.

**Engines.**—The Engine Sub-Committee has held 29 meetings during the year 1917-18, and has received 131 reports and memoranda on various matters. The work has been of very varied character. The advice of the Committee was invited by the Air Board on several occasions with regard to the engine programme, and the selection of engines for future development. In order to arrive at a decision on questions submitted to them the Sub-Committee has visited works and inspected engines under test conditions. Among other matters which have been before them for discussion may be mentioned the methods of engine testing, engine design for high altitudes, the causes of failure of crankshafts and other parts, gearing, methods of cooling, methods of preventing freezing at high altitudes in water-cooled engines, special fuels, &c. Considerable attention has been given to matters connected with magnetos and ignition, and a large amount of experimental work in this direction has been carried out at the National Physical Laboratory and at the Royal Aircraft Establishment. At the latter also numerous investigations have been carried out for the Committee on engines and engine cylinders, which are referred to more particularly in the section of this report which deals with the experimental work done at the Establishment. A series of reports giving the results of experimental investigations undertaken for the Sub-Committee has been prepared for confidential issue, as explained.

The Sub-Committee desires to acknowledge the assistance which has been given it on many occasions, in the consideration of special matters, by the technical representatives of manufacturing firms who have attended its meetings and have communicated valuable papers and reports on questions under discussion.

**Light Alloys.**—The Light Alloys Sub-Committee was formed in February, 1917. Since that date it has held 18 meetings and has received 93 reports and communications. Experimental work has been carried out for the Sub-Committee at the National Physical Laboratory, the Royal Aircraft Establishment, Birmingham University, and Manchester University, as well as by the Aeronautical Inspection Directorate and at works foundries. The result has been to secure, and to disseminate, a large amount of valuable information with regard to both cast and wrought aluminium alloys suitable for use in the manufacture of engines and aircraft parts. Experiments have been made with a number of new alloys, and every effort has been made to accumulate systematic data with regard to alloys in common use, as well as to the newer alloys which appear to exhibit valuable characteristics.

The volume of work on light alloys dealt with at the National Physical Laboratory has been very large, and it has been necessary to ask for additional staff to enable it to



be continued and extended in the future. The tests usually made of a new alloy include the tensile strength at ordinary and at high temperatures, the casting properties, contraction, &c., conductivity, coefficient of expansion, while impact, hardness and repeated stress tests at various temperatures have been made on many of the alloys. At the Royal Aircraft Establishment engine cylinders and pistons have been cast in special alloys and have been run under working conditions. Professor Lea, of Birmingham University, has worked throughout in the closest possible co-operation with the aluminium foundries, and has kept the Sub-Committee informed as to the progress made in the introduction of new alloys into practice. The wrought alloys have been investigated mainly at the National Physical Laboratory, and with these also substantial progress has been made. The Sub-Committee is indebted to Professor Edwards, of Manchester University, for much valuable assistance in the researches relating to casting alloys; and desires also to acknowledge information and help given to it by many firms and individuals. A series of confidential reports summarising briefly the work accomplished by the Sub-Committee is in preparation; a few of these have already been issued.

**Fabrics and Dopes.**—Research in connection with this section of the work has been continued as in previous years. The work done has included tests of special fabrics and dopes, the further investigation of methods of protection of fabrics, especially airship fabrics, the testing of special materials suggested for wing coverings, determinations of hydrogen purity, and the investigation of methods of determining the purity of hydrogen and the permeability of airship fabrics. Assistance has been given to "X" Aircraft Depot in an investigation relative to the effect of tropical exposure on fabrics. Reports on other matters have been received from "X" Aircraft Depot, and the Committee is again indebted to Dr. Shakespear, of Birmingham University, for the communication of much valuable information as to methods devised by him for the testing of fabrics for permeability, and as to results obtained in various series of tests carried out under his control. Some interesting reports on experimental work carried out by them have also been received from the North British Rubber Company.

**Seaplane Research.**—Research on float models and models of flying boats in the William Froude National Tank has been actively continued. Additional apparatus has been designed and constructed for the extension of the experiments in certain directions. With regard to one section of the investigations the department has been in close co-operation with the Royal Aircraft Establishment, to which special work had been assigned in connection with seaplane design. Some experiments in connection with airships have also been undertaken. Two reports on the work carried out in the Tank have been received by the Committee during the year.

**Other Engineering Work and Special Investigations.**—A large amount of work has been carried out in the Engineering Department of the National Physical Laboratory, whether in connection with particular researches required by the Committee or Sub-Committees, or in response to special requests received from the Air Ministry. Among investigations of the former class may be mentioned the general research on the transmission of heat from surfaces to fluids in motion over them, experiments on engine cooling and radiators, impact and hardness tests on light alloys at various temperatures, tests of timber, struts, &c. For much of this work special apparatus has been designed and constructed.

The number of special investigations carried out for the Air Ministry and the Admiralty has been very considerable, and the work has extended to almost all departments of the Laboratory. It would appear undesirable to specify the particular matters dealt with, but it is clear that the assistance the Laboratory may be thus able to render is very valuable, and the Ministry have indicated that they desire to make increased provision for work of this character in the future.

**Airships and Kite Balloons.**—A Sub-Committee\* was appointed in August, 1917, to consider certain matters relating to airships and kite balloons on which the advice of the Committee had been requested by the Director of Air Services, Admiralty. A preliminary report was submitted in the same month giving replies, so far as was possible with the information then available, to specific questions raised. Four meetings have been held, and experimental work has been in progress. A further report is now in preparation.

**The Air Inventions Committee.**—This Committee was formed by Lord Cowdray in August, 1917. As originally consti-

tuted it consisted of six members of the Advisory Committee, with eight others, chosen either for their special scientific experience or for their connection with the Flying or Anti-Aircraft Service. The Chairman is Mr. Horace Darwin, F.R.S. It reports monthly to the Advisory Committee, and important inventions are referred, when considered desirable, to that Committee. On the other hand it is now under the general supervision of the newly-appointed Chief of the Air Staff, and its meetings are attended when necessary by representatives of the G.H.Q. Home Defences and of the Technical Department of the Department of Aircraft Production. The Committee has also been authorised to invite the attendance of aircraft manufacturers (through the Society of British Aircraft Constructors) when this is thought to be desirable.

With this constitution the Committee hopes to be able to keep in close touch with the most recent experience at the front, as well as with all new methods and manufacturing developments, and thus to ascertain the most pressing needs of the moment as regards inventions.

The *personnel* is completed by a Secretary and Examiners. The work is done largely through Sub-Committees, of which there are five. The number of inventions received since the formation of the Committee is about 4,000; these are placed on receipt in two categories—(A) those requiring further consideration; (B) those which can be rejected at once. Class A inventions are further considered either by individual members of the Committee or by one of the Sub-Committees. In some cases they are referred for the opinion of other experts, and when thought desirable experiments and trials are carried out before a final decision is made. Funds are at the disposal of the Committee for the development of an invention when considered to be of value. There is a good deal of inter-communication with the two other Inventions Committees, *i.e.*, the Munitions Inventions Department, and the Board of Invention and Research, and duplication is prevented mainly by overlap of membership and the cordial relationship between the three Committees.

Information regarding the appliances and methods in use in other countries has hitherto been obtained chiefly through the *liaison* officers, but arrangements are in contemplation for inviting representatives of the Allies to attend meetings when subjects of mutual interest are being discussed.

**Accidents Investigation Committee.**—The Committee has, on a number of occasions, been asked by the Department concerned to undertake investigations in connection with accidents. The information derived from such investigations is often of the very greatest value. Recently an Accidents Department has been formed under the Air Ministry, and a special Committee, of which Lt.-Col. O'Gorman is Chairman, has been appointed to advise as to questions arising in relation to accidents, and as to investigations required to ascertain the causes which have led to them, and the measures desirable to provide a remedy. It has been arranged that this Committee shall report to the Advisory Committee, which will give assistance, when required, in the carrying out of special investigations and experiments which the Accidents Committee may desire to have made. As in other instances, this co-operation will be of great advantage to both Committees, and the work may be expected to lead to important improvements in construction and design. The value of the investigations undertaken in relation to accidents has been strikingly illustrated in a case which has recently been under consideration by the Committee.

**Other Special Matters.**—Reference may be made briefly to a number of other special matters. The Committee was requested by the Aeronautical Society in October, 1917, to nominate a representative to serve on the Technical Terms Committee of the Society. The Committee nominated their Secretary, Mr. F. J. Selby, to serve on their behalf. Lt.-Col. O'Gorman is Chairman of the Technical Terms Committee, which has now been constituted also a special Committee of the Engineering Standards Committee, in the section dealing with Aircraft Standardisation.

Special arrangements have been made for the continuation and extension of the series of abstracts of technical papers relating to aeronautics formerly prepared by the Secretary, and printed in the Technical Reports of the Committee. In this matter the National Physical Laboratory is acting in co-operation with the Aeronautical Society and with the Intelligence Department of the War Office. This Department will undertake the printing and circulation of the abstracts, while it is understood that they will be printed also in the Aeronautical Society's Journal.

Under a scheme arranged by the Aeronautical Society, lectures on aeronautics have been given, with the Committee's permission, by members of the staff of the National Physical Laboratory at a number of centres throughout the Kingdom. It is understood that these have been found of

\* The members of this Sub-Committee are as follows:—  
Sir Napier Shaw, F.R.S. (Chairman); Mr. A. Mallock, F.R.S.; Lieut.-Col. Mervyn O'Gorman, C.B.; Professor J. E. Petavel, F.R.S.; Mr. C. T. R. Wilson, F.R.S.; Wing Comdr. the Master of Sempill and Lieut. W. H. Rose, of the Air Ministry; Wing Comdr. Cave Brown Cave; Mr. F. E. Smith, O.B.E., F.R.S., of the National Physical Laboratory; with the Chairman of the Advisory Committee for Aeronautics (*ex-officio*).



much value, and they will, it is hoped, stimulate and quicken interest in the general study of the subject.

In July, 1917, a request was received from Professor G. H. Bryan that the Committee would give him assistance to enable him to obtain such data as he might need in connection with researches on the stability of the aeroplane on which he was engaged. The Committee were informed that a grant had been made to Professor Bryan by the Department of Scientific and Industrial Research to enable him to devote himself, for a period, to the prosecution of his investigations relating to the stability of the aeroplane, and they willingly offered to render such assistance as was within their power. It is understood that Professor Bryan has already arrived at results of considerable interest.

The Committee desire to express their thanks to the many firms and individuals who have given them assistance in various ways, by personal attendance at meetings, by the contribution of papers giving valuable information, or by assistance in experimental work. The cases in which such help has been rendered are too numerous to be referred to in detail, but acknowledgment must be made of the co-operation given by Professor Sir James Dewar, at the Royal Institution, in experiments on light alloys at low temperatures. An interesting communication relative to a matter which was under consideration by the Committee was received from Professor A. E. H. Love, of Oxford University.

**EXPERIMENTAL WORK AT THE ROYAL AIRCRAFT ESTABLISHMENT.**—As in previous years the Committee are much indebted to the Staff engaged in experimental work at the Royal Aircraft Establishment for their valuable contributions to the general progress made in aeronautics research. These contributions, which are most fitly characterised, in general, by the term "full scale work" which has been applied to them in the past, cover a very wide field. In addition to experiments on aeroplanes in flight, which in themselves are of a very extensive and varied character, they include a most important and comprehensive series of investigations relative to engines, and engine parts and accessories, a large amount of experimental work on alloys for engine construction, including foundry work and the manufacture and testing of numerous trial cylinders and pistons in various alloys, as well as of complete engines, investigations relative to fabrics and dopes, the study of instruments of all kinds for use on aeroplanes, and many other matters.

The measurements on aeroplanes in flight are an important and essential complement of the model experiments, and have led to many valuable and interesting results. The co-ordination of the full scale and model work effected by the "Scale" and Aerodynamics Sub-Committees has been of definite advantage in controlling the conclusions to be drawn from the two classes of experiments, and the special investigations called for by these Sub-Committees, while entailing a large amount of experimental work, have left the ground clear for more rapid progress in the future. A considerable part of the full scale work at the Royal Aircraft Establishment on aeroplanes in flight during the past year has been done for these Sub-Committees in confirmation and amplification of the observations on models. In addition to calculations based on determinations of "performance," and on force measurements, much work has been done on the measurement of actual loading and its distribution on wings in flight, and some remarkable results have been obtained. Among other matters to which much attention has been given may be mentioned the careful study of the conditions which accompany "spinning," and the investigation of controllability, including the design of the necessary instruments for making the observations in flight required.

#### **Dominion Journalists at H.P. Works.**

On Monday the party of journalists from the Dominions and foreign countries spent a most interesting time inspecting the works where the Handley Page giant aeroplanes are built, and afterwards witnessed exhibitions by machines of various sizes which were ready to be despatched on active service. Some of them were also privileged to enjoy a trip over London in one of the H.P. machines.

Mr. Handley Page presided at a luncheon subsequently, and, in proposing the health of the Chairman, Lord Montagu said he had no doubt that he would accompany Mr. Handley Page one of these days on a voyage to India. He also reminded those present that that day was the tenth anniversary of Wilbur Wright's first real flight in Europe. Then 9 stone was about the limit of weight which an aeroplane carried; now a load of 3½ tons was thought little of. He predicted a great commercial future for aeroplanes.

Mr. Page remarked that commercial aviation loomed large in the public mind at the present moment, and in that respect

A large number of investigations in relation to engines have been carried out at the request of the Engine Sub-Committee. These include the design and construction of plant for testing engines under high altitude conditions, the investigation in actual flight of the variation of engine power with height, the continuation of experiments on air cooled cylinders and engines, as well as researches relative to engine temperatures, methods of cooling, magnetos and other accessories, and a number of other problems. In close connection with this work, a large amount of research has also been carried out for the Light Alloys Sub-Committee, including the study of special alloys, the casting of cylinders and other engine parts, in alloys of different composition, and the examination of their behaviour under running conditions. Important conclusions have been reached from the comparison of cylinders of different materials.

Investigations have been made on various substitutes for materials difficult to obtain in the quantities necessary for the largely increased production of dope. It has been possible to reduce considerably the quantity of doping material required.

Improvements on the standard aeroplane instruments have been made, and the methods of testing them with rapidity and accuracy have been advanced. Instruments have been constructed for the full scale measurements, and the work on bomb sights has been continued.

**METEOROLOGICAL WORK.**—A considerable number of meteorological enquiries have been answered and a number of papers relating to meteorological problems have been presented to the Committee. A comparison of the observations of wind velocities in the upper air by means of pilot balloons with those obtained by other methods has given satisfactory results.

The special experimental work in meteorology carried out for the Committee at the Branch Meteorological Office at South Farnborough has been mainly concerned with the methods for noting and recording lightning. The work was carried on by Capt. Cave, R.E., with the assistance of Mr. R. A. W. Watt, until June 30th, when Capt. Cave was transferred to the Office at South Kensington in order that he might bring the experimental work into daily practical relation with the forecast service. Part of the work was transferred with him, and he retained the Superintendence of the enquiry. Mr. Watt became meteorologist in charge of the Branch Office and the experimental work at South Farnborough. He was joined temporarily by Mr. N. Tunstall, assistant in the Laboratory of Sir Ernest Rutherford at Manchester, and later by Mr. E. L. Hawke, as professional assistant. After a few months' work at the Office, Capt. Cave was invalided, and on his recovery was placed in charge of one of the units of the Meteorological Section R.E. His services are no longer available for the experimental work.

The experimental work has included the design and construction of the apparatus necessary for the equipment of two other stations to act with South Farnborough. Plans have been prepared for the erection of the necessary apparatus, but progress is arrested for the time being for want of assistants who have been or can be trained in the special work. The provisional trials made with the stations available elsewhere have shown that an effective answer to the enquiry is quite within the capacity of the instruments at three properly equipped stations in suitable positions.

Interesting results have been obtained in connection with the study of eddy motion, with an anemometer of special design exposed on a tall chimney, and a contribution has been made to the difficult subject of the variation of wind velocity near the ground.

Signed on behalf of the Committee,

RAYLEIGH, President.

they had made progress with great strides. This was no doubt due to the driving force of the war. The flights to Constantinople and the recent flight to Cairo indicated what could be done in days of peace, and he predicted that commercial aviation in the future would be a paying concern, so long as it was properly organised, and aviation grounds were considered in the same ratio as the actual flying. He spoke enthusiastically of the progress of British machines, remarking that the Handley Page machine had carried the greatest weight ever borne by any one aeroplane—namely, 21 passengers and a pilot.

Sir William Sowden, of Adelaide, promised a great reception in South Australia to the British aviator who flew from England to Australia.

Mr. Joynson-Hicks said that if firms like Handley Page had been encouraged in the past, the war might have been over by now, and he ventured to think that if a great effort were made the war would be over by victory in the air next year.

# PERSONALS

## Casualties.

Lieut. CEDRIC GEORGE EDWARDS, D.F.C., R.A.F., previously reported missing, now reported killed in action on August 27th, aged 19, was the elder son of Mr. and Mrs. J. F. Edwards, of the Homestead, Lemsford Road, St. Albans.

Lieut. RICHARD EVELEIGH HODGSON, King's Liverpool and R.A.F., who was killed in action on September 16th, aged 24, was the elder son of C. H. Hodgson, Sherborne School, and fiancé of Violet Grimley, St. Crispin's, Sherborne.

Lieut. E. C. H. R. NICHOLLS, Queen's Royal West Surrey Regt. (attd. R.A.F.), who was killed on active service on September 20th, aged 20, was the only son of Mr. and Mrs. E. F. Nicholls, of Weybourne, Woking.

Capt. LEOPOLD VICTOR ROYLE, M.C., Flight Commander, R.A.F., who was killed on August 17th whilst flying on a scout patrol, was the elder son of Mr. Arnold Royle, C.B., and Mrs. Royle, Albany Lodge, Esher. Born in 1882, he was educated at Wellington College. He joined the Egyptian Government service in 1900, and served continuously in the Coastguard Administration until war broke out, when he was lent to the R.F.C. He saw much service on the Canal and Sinai Peninsula as an observer with the R.F.C., and when the Turks induced the Senussi to take up arms in 1915 he was transferred to the Western Desert, and served as Intelligence Officer to the British force operating in that area. His special knowledge of the language and character of the Western Beduins, and especially the Senussi—he was one of the few Englishmen who had actually met Said Ahmed, the Grand Senussi, and was on terms of friendship with Said Idris, the present head of the Senussi—rendered his services particularly valuable. He guided the Duke of Westminster's armoured cars which rescued the crew of the *Tara*, and for his services on this and on other occasions he was awarded the Military Cross. At the beginning of 1917 he took part as Intelligence officer in the operations against the Siwa Oasis, where the Senussi were finally routed, and it was in a large measure due to his intimate knowledge of the Western Desert that these operations were successfully carried out. He was again mentioned in dispatches, and awarded the Italian Medalle ad Valore and the Egyptian Order of the Nile. At the conclusion of these operations the Egyptian Government claimed Capt. Royle's services, and he was appointed Governor of the Western Province, which embraced the coastal sector west of Alexandria and also the Siwa Oasis. He was also given the local rank of major. After repeated applications to the Egyptian Government for his release, he was permitted to rejoin the R.F.C. at the end of 1917, and after passing with honours all examinations, obtained his "wings," and was appointed to the command of a scout flight at the front, to which he proceeded in March, 1918, and where he served continuously until his death.

Sub-Lieut. EDWARD G. C. UNWIN, R.N.V.R., who was killed in action on September 3rd, aged 22, was the eldest son of the Rev. W. C. Unwin, vicar of Loppington, Selop. Born in Sheffield, he was educated at the Orme Grammar School, Newcastle-under-Lyme. He volunteered in November, 1914, and served with the Hawke Battalion, R.N.D., in Gallipoli, being wounded on June 4th, 1915, while going up to the trenches at Spur. He was appointed to a commission as sub-lieutenant, R.N.V.R., for service with the 63rd (R.N.) Division in December, 1917. He had been accepted by the R.A.F.

Lieut. G. A. J. ASHWIN, R.A.F., who was accidentally killed while flying, was the only son of Mr. John Ashwin, of 5 Crosby Square, E.C. He was educated at Ramsgate College, and when 17½ years of age joined the London Regiment in September, 1914. In January, 1915, he went to France and fought at the second battle of Ypres, Neuve Chapelle, Loos, High Wood, Vimy, and in the Somme, in which actions he was twice wounded. In February, 1917, he returned to England to join the R.F.C., and on receiving his commission returned to the front, and after considerable service was killed with his observer.

Lieut.-Col. EDMUND M. TUDOR BODDAM, R.E., who died recently at the age of 64, was a son of the late General Tudor

Boddam, and specialised as an artillery officer in the Royal Engineers. Col. Boddam invented an automatic gun sight for high angle fire. He pointed out an error in the sights that were used in the early days of the war, giving the military authorities his revised calculations for the high angles as required in aerial warfare, and an apparatus embodying the principles, which was adopted. His sighting apparatus for bombing from aircraft had been thoroughly tested by the National Physical Laboratory, and recommended by the experts for adoption.

In 1908 he married Sarah Elizabeth (Violet), eldest daughter of the late Jacob Wood and Mrs. Wood, of Hagg House, Morpeth, Northumberland.

Lieut. RICHARD FRANK HILL, M.C., R.A.F., of Brook House, Jarvis Brook, Crowborough, and Hollymount, Buxted, Sussex, son of the late Frank Hill, and grandson of the late Richard Hill, was born on April 28th, 1899. He was educated at The Grange, Crowborough, and Charterhouse (Weekites), on leaving which at Easter, 1917, he joined the R.F.C., and soon proceeded to France, where he quickly distinguished himself, gaining the Military Cross. On returning to England last autumn he served at home until his death, which occurred on September 17th, as the result of appendicitis, for which he had undergone two operations.

Capt. NORMAN PRESTON MORRIS, R.A.F., who died on September 17th as the result of an accident, aged 42, was the husband of Leslie A. Morris, of Breezepoint, Reigate, and second son of the late Arthur Morris and of Mrs. Morris, Dungate Manor, Reigate.

Sec. Lieut. CHARLES EVANS THORP (CHARLIE), R.A.F. (observer), who died of wounds received in action on August 30th, aged 19, was the elder son of Mr. and Mrs. A. Evans Thorp, of Leytonstone, Essex. He was educated at Laleham College, Margate, and St. Paul's School. He joined the Artists' Rifles, O.T.C., in September, 1917, and transferred to the R.A.F. (then the R.F.C.) in January, 1918. He went to the front on August 18th last, and had been in action five times.

## Married.

Capt. CHARLES S. BIGNELL, R.A.F., of Shanghai, eldest son of the late Mr. Bignell and Mrs. Bignell, of Golders Green, was married on September 9th at Kingston Road Chapel, Reading, to GLADYS EMILY, only child of the late Henry Meynell PAINE, Esq., (and granddaughter of the late Mr. Joseph Caine Paine, R.N., Worthing), and Mrs. Boodle, and stepdaughter of Dr. R. M. Boodle, Reading.

2nd Lieut. SYDNEY EDWIN BOOTH, R.A.F., only son of the late Edwin Booth (of Sydney, N.S.W.), and of Mrs. E. Booth, of Manor Grove, Beckenham, was married on September 21st by special licence, at St. Mary's, Shortlands, to HILDA WINIFRED, third daughter of George COWEN, of Heathfield, Scott's Lane, Shortlands.

Major H. A. BUSS, D.S.O., R.A.F., younger son of H. S. Buss, Esq., of Ambry Court, St. Nicholas at Wade, Thanet, was married on September 17th at Dawlish to EDWINA FLORENCE, only daughter of W. R. LARKINS, late major, East Surrey Regt., and of Mrs. Larkins.

Lieut. COLIN H. CLIFFORD, R.A.F., third son of George William Clifford, St. Hillary, Poole Road, Bournemouth, was married on September 17th at Christ Church, Down Street, W., to EVANGELINE, only daughter of the Rev. E. S. HILLIARD, vicar of Christ Church, Mayfair.

Lieut. J. DOUGLAS COWIE, Argyll and Sutherland Highlanders and R.A.F., only son of Mr. and Mrs. J. W. Cowie, Heathside, Putney, S.W., was married on September 18th at St. Luke's, Redcliffe Square, South Kensington, S.W., to PHYLLIS MAY, only daughter of Mr. Stanley DUTTON, 19, Bramham Gardens, South Kensington, S.W.

Capt. H. A. HAMERSLEY, M.C., R.A.F., eldest son of Mr. and Mrs. H. Hamersley, Guildford, West Australia, was married on September 19th at Emmanuel Church, Clifton, Glos., to CLARICE, only daughter of the late C. E. LEES, Esq., 34th Pioneers, I.A., and of Mrs. Carter, Jesmond Dene, Wellington College Station, Berks.

Major F. S. MOLLER, M.C., R.A.F., eldest son of Mr. and Mrs. H. C. Moller, of Chelsea, was married on September 15th



at Chelsea, to LILIAN ANNE LOUISE, daughter of Mr. and Mrs. Morgan DAVIES, of Cardiff.

Major H. WAYMOUTH PRANCE, R.A.F., late Second in Command of London Regt. (Gallipoli campaign), son of the late Miles Prance, Barrister-at-Law, and Mrs. Prance, of 39, Westbourne Gardens, W., was married on September 18th at St. Matthews, St. Petersburg Place, W., to AITHNA CONSTANCE FRANCES, only daughter of Mr. and Mrs. C. S. GOVER, of 8 Moscow Court, W.

Capt. GEORGE GERALD RAE-FRASER, R.A.F., elder son of the late George Rae-Fraser, of Piggott's Manor, Letchmore Heath, Herts, and 31, Copthall Avenue, London, was married on September 19th at Holy Trinity Church, Brompton, S.W., to ELINOR VERA, only surviving daughter of William GRIEVE, of Rockcliffe, Dalbeattie, N.B., and 13, Fenchurch Avenue, London.

Major RONALD WELLS, M.C., R.A.F., was married on September 18th at St. Paul's, Knightsbridge, to THELMA, only daughter of Mr. and Mrs. Reginald BLOXSOME, 203, Knightsbridge.

Lieut.-Col. H. L. WOODCOCK, R.A.F., was married on September 12th at the Chapel Royal, Savoy, to ETHEL, eldest daughter of W. T. BIRCH, Cape Town, South Africa.

Lieut. DENNIS MAX CORNELIUS WOODRUFFE-PEACOCK, R.A.F., eldest son of the Rev. Edward Adrian Woodruffe-Peacock, M.A., Cadney, Lincolnshire, was married on September 18th at St. John's Church, Caterham Valley, to GLADYS HAYNES, daughter of the late John STRONACH, of Huntley, and adopted daughter of David Edgar and Helen Parry, of Roseneath, Caterham Valley.

#### To be Married.

A marriage has been arranged and will take place quietly at the Capel Royal, Savoy, at 2 p.m., on Wednesday, October 9th, between Capt. A. G. N. BELFIELD, R.A.F. (late Devon Regt.), only son of Arthur Belfield, 5, Kensington Square Mansions, W. 3, and CLARISSE, only daughter of Mr. and Mrs. HENEY, 30, Doverfield Road, S.W. 2.



#### Back from Germany.

THE following officers, who were prisoners of war in Germany, have now arrived in England:—

Leckler, Sec. Lieut. A. N., R.F.C.  
Ordish, Sec. Lieut. B. W. A., R.F.C.  
Snook, Capt. C. W., R.F.C.

#### The Royal Canadian Air Service.

It is announced that the establishment of the Royal Canadian Air Service has been completed. Discipline in this corps will be the same as that in the Canadian Navy.

#### Aerial Transport in Scandinavia.

A LARGE Swedish air transport company has been formed with a capital of 1,000,000 kr. (£55,500), with its headquarters at Malmö. The aerial line will run Malmö-Stockholm-Gothenburg-Malmö. It is contemplated to open communication with Germany, Denmark, and Finland in the future.

#### Why Fritz Left Home.

"The Allied airmen bombard Cologne and Coblenz and other places daily," writes the Sittard correspondent of *Het Volk*, "and many people are killed and injured daily. The figures of fatal cases published in the German papers are much below the actual total. Refugees are leaving these towns for Holland for safety."

#### New German Scout.

"FRENCH aeroplane patrols operating with the First American Army, on September 19th," says the *Times* correspondent with the American Army, "encountered an entirely new type of German machine, which is extremely speedy and quick in manœuvring. Three French aeroplanes attacked three enemy planes, one of which was driven down out of control, but the observer was seen to jump and descend safely by parachute. It is believed that all the best German air fighters are equipped with parachutes, so that if their machines are damaged they can escape."

#### Fate of a Vienna "Raider."

ONE of the Italian pilots who accompanied Major Gabrielle d'Annunzio on his trip over Vienna has fallen. This is Antonio Locatelli, whom d'Annunzio had nicknamed his Young Lion Guard. He went on a trip on the morning of September 15th to Fiume, and the Austrian wireless announced that an aeroplane while flying over Fiume was brought down in flames by marine anti-aircraft artillery.

A marriage has been arranged and will shortly take place, between Major F. J. L. COGAN, R.A., and R.A.F., and ELISABETH, widow of Lieut.-Col. R. O. KERRISON, Hussars.

A marriage has been arranged, and will take place on October 5th at 2.30, at the Parish Church, Bromley, Kent, between Capt. FREDERICK RUSSEL HARDIE, Hussars, attached R.A.F., younger son of Mr. and Mrs. William Hardie, of 50, Victoria Road, Kensington, and ESTELLE, daughter of Charles Harwood CLARKE, of Whitley Bay, Northumberland.

A marriage will take place on October 10th between Lieut. HUGH A. LITTLETON, D.S.O., R.N.V.R. (formerly Flight Commander, R.N.A.S.), and MARY, elder daughter of the Archdeacon of Ross and Mrs. J. BECHER, at Berehaven Church, Co. Cork, at 2.30, leave permitting.

The engagement is announced between Major R. D. OXLAND, R.A.F., second son of Charles Oxland, and THELMA MARION (PETER), youngest daughter of Alan S. DUMBLETON, Victoria, B.C., and grand-daughter of the late Henry Dumbleton, of Hallgrove Park, Bagshot.

The marriage arranged between Mr. ARTHUR F. WOOD, A.D.C., R.A., attd. R.A.F., and Miss DAISY MARTYN RENNIE will take place in Glasgow on October 12th.

#### Items.

Lieut. P. C. CAMPBELL MARTIN, Sherwood For., and R.A.F., had the honour of being received by His Majesty the King, at Buckingham Palace, on September 18th.

Capt. DONALD ALASTAIR LESLIE DAVIDSON, R.F.C., M.C., of Belgrave Square, W., a Page of Honour to King Edward from 1902 to 1907, who was killed in April, son of Lady Theodora Davidson and nephew of the present Lord Albemarle, has left £368.

Senator Guglielmo Marconi and Major-Gen. Sir Godfrey Paine (Inspector-General, R.A.F.) had the honour of being received by the King at Buckingham Palace on September 23rd.

#### An American Flyer in Switzerland.

AN official note issued in Berne on September 12th stated that that morning an American aeroplane landed near Chevenez. It continued its flight, but landed again near Fahy. The two airmen have been handed over to the Swiss military authorities.

#### What Birmingham is Doing.

THE Air Service was well represented at Birmingham on Saturday in the demonstration to show what "Brum" is doing to help win the war and to further stimulate the energies of those in the munition factories. In the procession, which was over two miles long, were members of the R.A.F., the American Air Service, and the City Air Defence Services. The last-mentioned as well as an R.A.F. kite balloon detachment gave displays which attracted great crowds.

#### Eleven Balloons in Four Days.

ONE of the American pilots Lieut. F. Luke, of Phoenix, Arizona, is specialising in the destruction of Hun kite balloons. He set fire to two on September 18th, making his bag 11 in four days. He also attacked a German aeroplane at dusk and brought it down, then landed beside the wreck and took the pilot prisoner.

#### Overseas Gifts.

DURING August £19,512 was raised by the Overseas Club and Patriotic League for war purposes, including over £3,000 to the Aircraft Fund, and the sum of £868 to the Royal Flying Corps hospitals, which have now been aided by the Overseas Club and Patriotic League to the extent of nearly £28,000.

#### A Gift from the Swazis.

THE High Commissioner for South Africa reports the contribution of a further sum of £2,000 as a gift from the Chief Regent, the chiefs and people of Swaziland to the King for the war. The gift has been acknowledged on behalf of His Majesty, who has approved of the money being used to buy an aeroplane for the Royal Air Force.

#### Seaplane and Shrimper.

AN extraordinary incident is reported as having occurred on September 19th. It appears that a seaplane came into contact with the mast and sail of a shrimp boat engaged in fishing, and in attempting to rise the seaplane lifted the boat out of the water. The mast broke and the boat settled again on her keel. The owner, the only man aboard, escaped injury, and the pilot of the seaplane, which was disabled, was rescued by another shrimper.

# THE ROYAL AIR FORCE

London Gazette, September 17th.

The following temporary appointments are made:—  
**Brigadier-General (Admin.).**—Lieut.-Col. (Temp. Col.) N. D. K. MacEwen, D.S.O., and to be Temp. Brig.-Gen. whilst so employed; Aug. 20th.

**Staff (Air) Officer, 1st Class.**—Maj. A. R. Martin, and to be Temp. Lieut.-Col. whilst so employed; Aug. 22nd.

**Staff Officers 2nd Class.**—And to be Temp. Maj. whilst so employed if not already holding that rank:—Capt. (Temp. Maj.) N. B. Tomlinson; April 15th. (Air.)—Maj. J. A. G. de Courcy, M.C.; Aug. 14th. Capt. W. P. Groves; Aug. 21st.

**Staff Officers, 3rd Class.**—Sec. Lieut. (Temp. Lieut.) E. W. Vine, and to be Temp. Capt. whilst so employed; July 31st. The initial of Capt. E. Page is as now described, and not as in Gazette July 19th.

**Staff Officers, 4th Class (1st Grade).**—And to be Temp. Capt. whilst so employed, if not already holding that rank:—Lieut. L. E. M. Gillman; April 20th. Capt. M. J. Golding; April 21st. Lieut. R. N. Bail, Lieut. W. A. C. Dicketts, Capt. M. H. Stephens; July 29th. Capt. R. L. Allport; Aug. 14th.

**Staff Officers, 4th Class (2nd Grade).**—And to be Temp. Capt. whilst so employed:—Lieut. V. L. Anderson; June 17th. Lieut. G. B. Anderson; Aug. 7th.

## Flying Branch.

**Maj. B. L. Huskinson, D.S.C.,** to be Temp. Lieut.-Col. whilst employed as Lieut. Col. (A.); July 27th.

**Capt. to be Temp. Maj.** while employed as Maj. (A.):—W. H. Tolhurst; Aug. 30th. T. Gran, M.C., F. S. Moller, M.C.; Sept. 10th.

**Lieuts. to be Temp. Capt.** while employed as Capt. (A.):—J. L. S. Gill; Aug. 30th. C. M. Maud; Sept. 1st. A. W. Welsh; Sept. 2nd. R. Iveland Chapman; Sept. 3rd. A. A. Callender, T. S. Symons; Sept. 4th. A. W. Franklyn, M.C.; Sept. 7th. R. T. Jones, W. J. Peace; Sept. 9th; W. G. Albu; Sept. 10th.

**Lieut. E. W. Grant** to be Lieut. (Dir.) from (O.); Sept. 4th.

**Lieut. (Temp. Capt.) T. G. G. Bolitho, M.C.,** relinquishes his temp. rank on reversion to Lieut. (K.B.); Sept. 6th.

**Lieuts. (Obs. Officers)** to be Lieuts.:—(A.):—A. Sattin; Aug. 20th. I. G. Fleming; Aug. 23rd. A. C. T. Perkins; Aug. 24th.

**Sec. Lieuts. (late Gen. List, R.F.C., on prob.)** are confirmed in their rank as Sec. Lieuts. (A.):—W. W. Ferguson; June 24th. J. R. Robbins; June 28th. J. O'Donoghue; June 30th. A. V. Hansford; July 6th. T. C. Owen, E. G. Robertson; July 7th. G. Sutcliffe; July 13th. A. M. Wilson, J. A. G. Henry, L. S. Bowker; July 15th. C. R. Abrahams; July 27th. A. L. Fechnie; July 29th. E. Henriques; July 31st. W. A. F. Cowgill; Aug. 7th. C. B. Clark; Aug. 8th. R. C. Mills; Aug. 9th. I. B. Williamson, J. Thibaudau, R. W. Murray; Aug. 10th. W. St. C. Slater; Aug. 11th. E. A. Burbidge, F. W. King; Aug. 12th. R. S. Gilbert; Aug. 14th. E. H. Henson, C. F. Cawley, C. C. M. Bell; Aug. 15th. E. G. Davies, S. H. Apling, M. McCullagh; Aug. 16th. R. W. Corner; Aug. 17th. W. R. Baskerville, C. A. Manzetti, W. M. Crofton, N. De Gersigny, P. J. Waller; Aug. 18th. G. W. McDougall, V. G. Record, D. S. Davies, L. Ramsden, J. H. Bauer, W. B. Thomson, L. J. Emerton; Aug. 19th. F. Christelow, S. B. Taylor, C. L. Hudson, M. W. M. Burnside; Aug. 20th. W. H. C. Robson, E. Everington, H. Rawsthorne, H. J. Smith (date of 1st commn., Feb. 2nd), W. T. Laurie, C. J. Rogers, F. Cornwell, F. Wilde; Aug. 21st. L. Hart, C. Buckton, R. M. Balfour, M. S. Dickinson, W. W. Routledge, R. O'Neill, T. J. Maloney; Aug. 22nd. G. A. Coulter, F. Seddon, E. H. Thistlethwaite, W. Badger, H. H. Towne, T. T. Smith, R. J. Twilton, F. Clarke, E. H. Sparshott, C. H. E. Coles; Aug. 23rd. T. Whitman, H. Entwistle, A. B. Williams, H. C. Dean, W. B. Day; Aug. 24th. D. H. Edmiston, J. E. Marigold, S. Horne, D. G. Tory, R. Williams; Aug. 25th. W. H. McLaughlan; Aug. 26th. A. J. Prentice, F. Frith, J. Bullough, P. D. D'Albena, A. E. Watson, S. Clark (date of 1st commn., Jan. 5th), E. E. Brown, A. M. Haybittle, E. B. Marsh, C. S. P. Wallace, N. C. Mackey; Aug. 27th. G. T. Polkinghorne; Aug. 29th. S. Braby; Aug. 30th.

**The following Prob. Flight Officers (late R.N.A.S.)** are granted temp. commns as Sec. Lieuts. (A.):—R. G. A. Bingham; June 13th. E. W. Henry; Aug. 1st. A. B. H. Youell, A. H. Garland; Aug. 15th. J. C. Williams; Aug. 16th. A. A. Goodall; Aug. 17th. R. V. Gordon, C. N. L. A. Dunderdale; Aug. 18th. M. D. Hart, M. D. Moore; Aug. 19th. B. M. Carter, E. M. Lomax; Aug. 20th. A. S. D. Laidlaw, E. N. Fenton; Aug. 21st. C. N. Dilly, J. I. Sanderson; Aug. 22nd. J. Shaw, E. E. Middleton; Aug. 23rd. H. E. Light, L. N. Higgins, H. R. McL. Reid; Aug. 24th. O. W. Mitchell; Aug. 25th. F. A. Fairburn, G. P. H. Carter; Aug. 26th. F. J. Turvey; Aug. 28th.

**The following are granted temp. commns. as Sec. Lieuts. (A.):**—C. L. Kelly (Temp. Sec. Lieut., N. Lan. R.); July 31st. C. E. C. Penny (Lieut., R. Fus.), and to be Hon. Lieut.; Aug. 14th. J. C. Burbidge (Lieut., Rif. Brig., S.R.), and to be Hon. Lieut.; Aug. 17th. H. H. Channing (Temp. Sec. Lieut., K.O. Sec. Bord.), D. Wood (Lieut., R.E.), and to be Hon. Lieut., E. S. Seaton (Lieut., Lond. R., T.F.), and to be Hon. Lieut., R. F. Shutes (Lieut., Norf. R., T.F.), and to be Hon. Lieut., C. E. Black (Lieut., C.F.A., C.E.F.), and to be Hon. Lieut.; Aug. 19th. J. Jackson (Temp. Lieut., Norf. R.), and to be Hon. Lieut., S. Bennett (Sec. Lieut., Ches. R., T.F.), W. Joffe, D.S.O. (Sec. Lieut., Yorks. L.I., T.F.); Aug. 20th. F. Sumsion (Lieut., Welsh R., S.R.) and to be Hon. Lieut., P. Seagrave (Sec. Lieut., L'pool R., T.F.); Aug. 21st. H. V. Taylor (Lieut., Durh. L.I., T.F.) and to be Hon. Lieut.; Aug. 22nd. L. S. R. Jones (Sec. Lieut., Devon R.), D. I. M. Kennard (Capt., High. L.I., S.R.), and to be Hon. Capt., J. Hunter (Temp. Sec. Lieut., Arg. and Suth'd Highrs.); Aug. 24th. D. C. Lockwood (Lieut., Notts and Derby R., T.F.), and to be Hon. Lieut., C. E. Rattee (Lieut., New Brunswick R., C.E.F.), and to be Hon. Lieut., C. G. Tanner (Lieut., Herts Yeo., T.F.), and to be Hon. Lieut., C. Berkeley (Lieut. C. Gds., S.R.), and to be Hon. Lieut.; Aug. 25th. A. P. Godfrey (Temp. Sec. Lieut., R. Lancs. R.); Aug. 26th. T. E. Foster (Sec. Lieut., R.F.A.), A. J. F. Bawden (Capt., D. of Corn. L.I., T.F.), and to be Hon. Capt., J. C. Wilson (Sec. Lieut., K. L'pool R., T.F.), A. A. Downs (Sec. Lieut., R. Suss. R., S.R.), N. H. Jay (Sec. Lieut., Suff. R., T.F.), E. G. Oliver (Temp. Sec. Lieut., Midd'x. R.); Aug. 27th. M. W. Nolan (Temp. Lieut., N. Lanc. R.), and to be Hon. Lieut., W. R. Christian (Sec. Lieut., R.F.A., S.R.); Aug. 28th.

**The following Flight Cadets** are granted temp. commns. as Sec. Lieuts. (A.):—L. G. Woolhouse; July 19th. R. G. Adams, C. H. Ahrens, L. E. Aldrich, M. Baker, W. Ballentyne, W. H. Barry, W. C. Birt, D. E. Bissell, G. Bolstad, S. R. Byrne, A. L. Burran, G. F. Boulton, G. H. Carley, J. D. Chisholm, J. M. Cram, A. McI. Davidson, G. R. Dransfield, F. W. Ervine, R. E. Gillespie, J. W. Grier, R. T. Graham, F. Gouthro, H. H. Harvey, K. Hayward, W. D. Hayter, N. L. Head, J. H. Hodgins, W. A. Howden, H. Kellman, S. W. Kesten, J. F. Lenahan, W. H. Lewis, L. H. L'Hollier, M. P. H. Liddy, C. R. Mills, E. McC. Moir, N. J. Moran, V. C. Moynes, D. L. Murchison, C. R. Murray, M. M. Nesbitt, R. N. Patterson, K. T. Phillips, W. P. B. Pugh, J. B. Roberts, C. J. Robinson, P. G. Rodier, J. E. Schingh, S. J. Shaw, E. W. Swackhamer, J. Weeding, H. B. L. Wilkinson, J. C. Wright; Aug. 1st. T. H. Allan, H. E. Archdekin, C. E. Arnold, J. E. Baucroft, R. W. Birdsell, F. H. Brady, F. T. Briggs, H. Brooks, W. R. Buchanan, J. A. Cardwell, H. T. Clark, C. R. B. Clarke, F. Campbell, O. V. Crawford, A. R. W. Dalley, F. Donnelly, E. J. Edwards, P. W. Ford, R.

Foy, J. P. Gilbert, W. Goldbeck, J. R. H. Hall, T. T. Hazlewood, H. E. Hieatt, E. B. Hubbard, C. B. Humphrey, A. G. Humphrey, S. N. K. Jones, C. B. Joy, R. W. Kellett, W. Lavoie, R. E. Leary, C. B. Loomis, E. J. Lynch, J. E. S. Lytell, W. F. MacDougall, C. E. Marrin, C. G. Mathias, J. Mellor, G. A. Millar, H. A. Miller, H. C. Mitchell, W. G. Moore, L. J. Murray, J. R. L. McGowan, W. J. McNab, R. C. Ostrom, J. M. Patterson, L. B. Patterson, W. Penhall, J. H. A. Pope, C. Reilly, J. E. H. Rogers, R. J. Sargent, A. L. Silverson, C. H. Slater, H. C. Sweetman, W. H. Taylor, W. F. Teale, D. L. Thorburn, H. Waddington, C. T. Ward, A. V. Waters; Aug. 8th. A. F. Arnold, W. G. Benson, G. A. Bover, L. T. Bradley, C. J. Church, E. S. Clark, A. Demorest, J. W. Devlin, H. Dove, T. W. Duncan, E. V. Finland, P. A. Freeman, R. J. Groome, L. E. Gunn, J. W. Haig, C. Herr, J. L. Hever, N. E. Horton, E. S. Hunt, L. J. Hunter, M. Hyman, F. D. Kilts, R. L. Jacks, L. H. Jackson, A. J. Lacasse, L. Lewis, G. F. Mack, T. S. Mekechnie, W. A. Middleton, E. R. Moore, T. R. Moore, E. L. Moorehouse, H. P. Mowat, G. H. Murray, C. W. Pattison, L. R. Pedlow, W. L. Phelan, C. F. Purdy, W. D. Robertson, G. G. Ross, P. G. Rowe, L. I. Sangster, H. V. Sarjeant, L. Satterthwaite, M. C. Sherwood, R. D. Smith, R. C. Stephens, A. T. Veness, A. R. Webster, G. J. Moore; Aug. 15th. W. A. Henry; Aug. 18th. F. R. Allen, J. M. Petch, H. Butlin, A. R. Pratt, K. C. Whitwell, L. Whitfield, C. E. Elliott, D. A. Thomson, S. W. Smith, J. Tate, J. D. Sloss, B. W. Weight, W. A. Peters, E. V. Lockyer, E. Tomkins, W. L. Lewis, R. C. Adams, C. M. Thompson, C. H. Thomson, O. Taylor, S. H. Potter, C. Farnon, W. H. Isted, J. W. Baxter, T. Cuthbert, C. S. Booth, R. V. D. White; Aug. 30th. B. Turner, H. M. Lang, R. J. Glen, R. C. Jones, N. F. Moxon, T. B. Young, A. E. Sissing, C. F. Williams, W. E. Finch, H. I. Wilcox, C. C. Williamson, J. D. Swallow, P. J. Parry, J. S. Newman, C. Lambe, A. Knox, F. G. Reid, L. Harrison, M. A. Watts; Aug. 31st. W. E. Dancy; Sept. 1st. R. K. Dickie; Sept. 2nd. R. D. Broad; Sept. 3rd. S. Poole, H. J. Berry; Sept. 4th.

**Sec. Lieut. H. S. Philp** (late Gen. List, R.F.C., on prob.) is confirmed in his rank as Sec. Lieut. (A. and S.); June 3rd.

**Sec. Lieut. J. M. Brown** (Sec. Rif., T.F.) is granted a temp. commn. as Sec. Lieut. (A. and S.); May 18th.

**The following Prob. Flight Officers (late R.N.A.S.)** are granted temp. commns. as Sec. Lieuts. (A. and S.):—M. H. Tench; June 7th. A. R. Thatcher; July 12th.

**The following Cadets** are granted temp. commns. as Sec. Lieuts. (A. and S.):—R. W. G. Le Sueur; June 8th. L. D. H. Nel; Aug. 10th.

**The following Flight Cadets** are granted temp. commns. as Sec. Lieuts. (A. and S.):—G. A. Robson; June 21st. E. P. Marren, W. Leslie; June 24th. C. B. Barton; June 25th. B. B. Sampson; July 6th. A. C. Buchanan, E. M. Connell, H. J. Pike, A. H. Cruickshanks, J. S. van R. Van der Spuy, A. T. Favard, I. P. B. Davies, W. S. Long; July 19th. W. P. E. S. Waller; July 23rd. J. W. McKinty; July 30th. A. J. Price; July 31st. H. Floyd; Aug. 13th. A. L. Corson; Aug. 16th.

**Sec. Lieut. V. T. H. Firench** (late Gen. List, R.F.C., on prob.) is confirmed in his rank as Lieut. (K.B.); Aug. 31st.

**The following are granted temp. commns. as Sec. Lieuts. (K.B.):**—A. Paveley (Temp. Sec. Lieut., attd. K.O. Sec. Bord.; July 1st. L. Clark (Temp. Sec. Lieut., attd. R. Berks. R.), N. V. Gay (Temp. Sec. Lieut., Oxf. and Bucks. L.I.), L. S. Duffell (Sec. Lieut., E. York R., T.F.); Aug. 17th. A. R. Blakeley (Temp. Sec. Lieut., Suff. R.); Aug. 24th. E. F. Smallbone (Lieut., R.G.A., S.R.), and to be Hon. Lieut.; R. P. Greey (Temp. Sec. Lieut., attd. Midd'x R.), W. C. S. Smith (Temp. Sec. Lieut., attd. E. Lan. R.); Aug. 31st.

**The following Sec. Lieuts. (late Gen. List, R.F.C., on prob.)** are confirmed in their rank as Sec. Lieuts. (Obs. Officers):—F. H. Paulton; May 7th. W. Urwin, L. Sabine; Aug. 30th. J. Myers; Aug. 31st. W. H. Hoskings; Sept. 11th. R. Fox; Sept. 13th.

**The following are granted temp. commns. as Sec. Lieuts. (Obs. Officers):**—R. Lucovich, M.C. (Temp. Sec. Lieut., Worc. R.), W. F. Evans, D.C.M. (Temp. Sec. Lieut., S. Staffs. R.), D. Neil (Lieut., Forestry Corps, C.E.F.), and to be Hon. Lieut.; April 1st. W. L. Kingwill, M.C. (Lieut., Norf. R.), and to be Hon. Lieut.; April 9th. J. P. Mackenzie (Sec. Lieut., R.F.A.); April 12th. C. T. de Guise (Lieut., Quebec R., C.E.F.), and to be Hon. Lieut.; May 3rd. C. P. M. B. Caillard (Lieut., Wilts. R., S.R.), and to be Hon. Lieut., H. Grieve (Sec. Lieut., L'pool R., T.F.); Aug. 27th. W. U. Tyrrell (Lieut., R. Ir. Rif.) and to be Hon. Lieut., G. A. F. Riley, M.M. (Lieut., E. Ontario R., C.E.F.), and to be Hon. Lieut., C. E. Kinton (Lieut., Nova Scotia R., C.E.F.), and to be Hon. Lieut., D. Bovill (Lieut., Manitoba R., C.E.F.), and to be Hon. Lieut., H. Douglas (Temp. Sec. Lieut., York R.); Aug. 29th. C. I. Mee (Lieut., C.F.A., C.E.F.), and to be Hon. Lieut., A. G. Pugh (Temp. Sec. Lieut., Manch. R.), S. M. Fairry (Temp. Sec. Lieut., Notts and Derby R.), H. J. C. Hartley (Sec. Lieut., Lond. R., T.F.), K. Jones (Lieut., R. Berks. R., T.F.), and to be Hon. Lieut., P. Bell, M.C. (Capt., Welsh R., T.F.), and to be Hon. Capt., E. Willis (Temp. Sec. Lieut., attd. R. Lan. R.), H. G. Pratt (Sec. Lieut., Welsh R., S.R.), A. Gladwin (Lieut., York and Lan. R., T.F.), and to be Hon. Lieut., W. Jones (Temp. Sec. Lieut., Manch. R.), J. H. Bolam (Temp. Sec. Lieut., Northd. Fus.), E. O. Rutherford (Temp. Sec. Lieut., E. York R.); Aug. 30th. C. Walker (Sec. Lieut., Notts and Derby R., T.F.), R. R. Hodges (Sec. Lieut., S. Staffs. R., T.F.), A. E. Stephenson (Sec. Lieut., R.F.A., S.R.), R. W. Lane (Temp. Sec. Lieut., Hamps. R.), H. E. Allan (Temp. Sec. Lieut., Tank Corps), W. S. Woolfe (Sec. Lieut., R. Berks. R., T.F.), R. W. Silk (Temp. Sec. Lieut., Northd. Fus.), B. S. Sylvester (Temp. Sec. Lieut., York and Lan. R., T.F.), B. W. Thwaites (Lieut., Lovat's Scouts, T.F.), and to be Hon. Lieut.; Aug. 31st. C. O'N. Daunto (Temp. Lieut., S. Lan. R.), and to be Hon. Lieut., R. G. Harris (Sec. Lieut., Linc. R., T.F.); Sept. 5th. F. Smith (Temp. Lieut., R.E.), and to be Hon. Lieut., J. Oliver (Sec. Lieut., Lond. R., T.F.), C. R. Leeke (Lieut., R.F.A., T.F.), and to be Hon. Lieut., G. A. R. Slimming (Temp. Lieut., A. Cyclist Corps), and to be Hon. Lieut., H. V. Alder (Temp. Sec. Lieut., R. Suss. R.), R. H. Griffiths (Temp. Sec. Lieut., Welsh R.), A. J. Tremblay (Lieut., W. Ontario R., C.E.F.), and to be Hon. Lieut., H. C. Ratcliff (Temp. Sec. Lieut., Yorks. R.), C. H. Woolvin (Temp. Sec. Lieut., Midd'x. R.); Sept. 7th. A. E. Hart (Sec. Lieut., Lond. R., T.F.), W. L. Dixon (Temp. Sec. Lieut., York and Lan. R.), B. G. Bowen (Temp. Sec. Lieut., York R.), D. C. S. Williams (Lieut., Derby Yeo., T.F.), and to be Hon. Lieut.; Sept. 16th. B. W. Smyth-Pigott, M.C. (Temp. Lieut., Durh. L.I.), and to be Hon. Lieut., C. G. Smyth-Pigott (Lieut., R. Wilts. Yeo., T.F.), and to be Hon. Lieut.; Sept. 8th. F. E. Dawe (Temp. Sec. Lieut., Glouc. R.); Sept. 11th.

**The following Flight Cadets** are granted temp. commns. as Sec. Lieuts. (Obs. Officers):—N. R. Lewis, R. G. Fullagar, N. R. McKinlay; Aug. 23rd. S. W. Atkinson, C. W. Blasdale, W. A. Bunc, C. E. Clarke, R. A. Clarke, P. A. Savoie, H. McNish, J. M. White, C. H. Abbey, T. Shortland-Jones, A. J. McD. Grimston, M. M. Miln; Sept. 6th. N. Nutton, H. Carding, S. W. Lummis, C. N. Strong; Sept. 10th. A. Trantor, J. A. Oliver, W. F. Marr, J. McCallum, A. Nesbitt, E. A. Slater, A. F. Taylor, R. B. Jones, W. Macfines; Sept. 12th. M. W. Dunn, C. J. H. May, A. B. Gates, H. S. Cres, A. P. Cannon, H. C. Eyre, J. H. Reid Smith, J. J. Nicholls, F. Owen, A. Hesketh; Sept. 13th. D. W. P. Boyd, S. F. Jones, N. Butt, F. M. R. Jones, A. J. Kelly, C. B. Cheetham, H. Lapish, J. Grant, J. J. Snow, A. V. Kidd, A. C. Faulkner; Sept. 14th. J. R.





The date of relinquishment of Sec. Lieut. C. P. Todd is Aug. 2nd and not as in *Gazette* Aug. 27th.

The initials of Sec. Lieut. F. E. L. Elliott (Camb. R., T.F.) are as now described, and not as in *Gazette*, June 7th.

The surname of Sec. Lieut. Harold Cooper is as now described, and not as in *Gazette* Sept. 10th.

The notifications in *Gazette* Sept. 6th regarding the following are cancelled:—Lieut. C. F. Kelsch, Sec. Lieut. J. M. Holloway.

## Administrative Branch.

Cpts. to be Temp. Maj. while employed as Maj. :—C. J. Page ; July 20th. (Hon. Maj.) A. N. Stuart ; Sept. 1st.

To be Temp. Maj. while employed as Maj. :—Sec. Lieut. (Hon. Capt.) A. J. Dawes (T.) ; April 1st. Sec. Lieut. (Hon. Lieut.) C. Harvey, Lieut. (Temp. Capt.) J. S. Holloway, Sec. Lieut. (Temp. Lieut.) C. A. E. Lloyd ; July 20th.

Sec. Lieuts. to be Temp. Cpts. while employed as Cpts. :—G. M. Bell from (T.), (Hon. Lieut.) T. M. Wheeler ; April 1st.

The following are granted temp. comms. as Lieuts. :—W. W. Legg (Lieut., R.F.A., S.R.) ; July 7th. J. D. Lyons (Capt., Res. of Offrs.) and to be Hon. Capt. ; Sept. 7th. J. S. Flanagan (Lieut. and Qrmr., Spec. List), G. W. Nelson (Lieut., Gord. Highrs.) ; Sept. 9th. Sec. Lieut. H. E. Storey to be Temp. Lieut. whilst employed as Lieut. ; April 9th.

Lieuts. (A.) to be Lieuts. :—F. S. Potts ; Sept. 9th. V. Phillips (Sept. 14th). Lieut. R. V. Tivy to be Lieut., from (O.) ; Sept. 9th.

H. Castle (Sec. Lieut., L'pool R.) is granted a temp. commn. as Sec. Lieut., and to be Temp. Lieut. whilst employed as Lieut. ; July 17th.

The following are granted temp. comms. as Sec. Lieuts. :—J. S. Betterton ; Aug. 21st. W. C. Hanney ; Aug. 20th. W. G. Illingworth, E. E. Blake, T. R. Davies, F. A. Pritchard, W. C. Van Eeden, A. F. Rees, W. Andrews, A. H. Wariner, W. C. Brown, H. E. Haddon, W. C. Cranfield, H. W. F. Long, J. S. Begg, H. J. De Waal, W. H. Hitt, W. Vaughan, J. O. Miles, C. W. Grey, G. G. Kirby, T. Mattocks, R. M. Balston, C. Jones, R. O. Griffith ; Sept. 14th. J. H. Tanton, J. Dale, J. H. Hankins, I. A. N. Beadle, R. E. G. Macmaster ; Sept. 19th.

Capt. R. H. Catleugh relinquishes his commn. on account of ill-health contracted on active service, and is granted the hon. rank of Capt. ; Sept. 21st.

Lieut. E. A. Salt relinquishes his commn. on account of ill-health, and is granted the hon. rank of Lieut. ; Sept. 21st.

Lieut. D. S. Broadhurst relinquishes his commn. on account of ill-health contracted on active service, and is granted the hon. rank of Lieut. ; Sept. 21st.

Sec. Lieut. H. F. Emerton relinquishes his commn. on account of ill-health contracted on active service, and is granted the hon. rank of Sec. Lieut. ; Sept. 21st.

The following Sec. Lieuts. relinquish their comms. on account of ill-health, and are granted the hon. rank of Sec. Lieut. :—P. Messenger, T. J. O'Sullivan, R. I. Whetman ; Sept. 21st.

The following Sec. Lieuts. resign their commissions :—C. H. Malone, C. H. Wilson ; Sept. 21st.

The notification in *Gazette* June 25th, concerning Sec. Lieut. S. L. Boothroyd is cancelled.

## Technical Branch.

R. R. Seward (Temp. Maj., R.E.) is granted a temp. commn. as Maj. ; May 22nd.

Lieut. H. E. Smith (R.N.R.) is granted a temporary commn. as Capt., and to be Temp. Maj. whilst so employed ; Sept. 11th.

Lieuts. (O.) to be Lieuts. :—S. S. Tyler ; April 1st. G. D. Gillie, M.C. ; Aug. 28th.

Lieut. (Temp. Capt.) T. L. Edwards relinquishes his temp. rank and reverts to Lieut., on relinquishing the appointment of S.O. ; Sept. 12th.

Sec. Lieut. H. P. G. Leigh to be Temp. Lieut. whilst employed as Lieut. ; Aug. 20th.

E. O. Brown is granted a temp. commn. as Sec. Lieut. ; Sept. 16th.

Lieut. S. R. Brokenska relinquishes his commn. on account of ill-health contracted on active service, and is granted the hon. rank of Lieut. ; Sept. 21st.

Sec. Lieut. A. W. Thompson relinquishes his commn. on account of ill-health, and is granted the hon. rank of Sec. Lieut. ; Sept. 21st.

## Medical Branch.

S. W. Fisher is granted a temp. commn. as Capt. ; Sept. 17th.

## Memoranda.

H. Welch (Capt. Notts. and Derby R.) is granted a temp. commn. as Capt. ; April 1st.

Lieut.-Col. (Temp. Col.) H. S. Ebben, O.B.E., relinquishes the temp. rank of Col. ; July 1st.

The date of appointment of Lieut. (Temp. Maj.) A. T. A. Dobson is June 27th, and not as in *Gazette* Sept. 10th.

Sec. Lieut. R. S. Griffiths to take rank and precedence as if his appointment as Sec. Lieut. bore date June 14th.

## Royal Flying Corps (Military Wing).

*London Gazette, September 13th.*

Balloon Commanders.—(Graded as Balloon Officers).—Lieut. A. J. Johnston, S.R. ; Dec. 1st, 1917. Temp. Lieut. H. E. Ambrose, Gen. List ; Dec. 8th, 1917.

## Schools of Military Aeronautics.

Instructor.—(Graded as an Equipment Officer, 1st Class).—Capt. R. G. Macnaughton, R. Highrs., T.F. ; Dec. 4th, 1917.

*London Gazette Supplement, September 16th.*

Flying Officers (Observers).—Lieut. J. E. Cross, Manch. R., S.R., and to be secd. ; Jan. 13th, seniority Oct. 24th, 1917. Sec. Lieut. L. J. Bayley, S. Lan. R. (T.F.), and to be secd. ; March 21st, seniority Dec. 8th, 1917 ; Sec. Lieut. H. J. Greenwood, M.C., W. York R. (T.F.), and to be secd. ; Dec. 7th, 1917.

Equipment Officers, 3rd Class.—The appointment of Temp. Sec. Lieut. J. Hooper, Gen. List, notified in *Gazette*, Nov. 7th, 1917, is antedated to Jan. 28th, 1917.

Temp. Sec. Lieuts. (on prob.), Gen. List, and to be confirmed in their rank :—E. H. Newson ; Dec. 24th, 1917. A. E. Curtis ; Jan. 1st. E. C. Day ; Jan. 21st. R. P. Coulter ; Jan. 24th. J. S. Sutherland ; March 1st. E. I. Davies ; March 21st.

*London Gazette Supplement, September 17th.*

Flying Officers (Observers).—The date of appointment of the following is Feb. 23rd, and not as in *Gazette* June 10th :—Lieut. J. W. E. Jamieson, Vaughan's Rif., Ind. Army ; Sec. Lieut. H. S. Green, Ind. Army Res. of Off. ; Temp. Sec. Lieut. P. D. Kirk, R.W. Kent R. ; Temp. Sec. Lieut. G. S. Oddie, L'pool. R.

*London Gazette Supplement, September 20th.*

Flying Officers.—Temp. Lieut. H. C. Douglas, Gen. List, from a Flying Offr. (Obs.) ; March 17th, seniority June 18th, 1917.

Temp. Sec. Lieuts. (on prob.), Gen. List, and to be confirmed in their rank :—J. A. Ruggles ; Nov. 2nd, 1917. F. R. Christiani ; Dec. 19th, 1917. C. H. G. Nida ; March 26th. R. D. Molesworth ; March 31st.

Flying Officers (Observers).—Lieut. W. M. Crabbie, R.A. (T.F.), and to be secd. ; July 13th, 1915, seniority May 30th, 1915. Lieut. W. K. Whittle, W. York R. (T.F.), and to be secd. ; Dec. 12th, 1917, seniority Nov. 7th, 1917.

Temp. Sec. Lieuts. (on prob.), Gen. List, and to be confirmed in their rank :—G. E. Maxwell ; May 30th, 1916, seniority April 1st, 1916. C. G. Pugsley ; March 25th, seniority Jan. 21st.

Equipment Officer, 3rd Class.—Appointment of Lieut. C. C. Morgan, R.A., S.R., notified in *Gazette* Feb. 21st is cancelled.

## Schools of Instruction.—Schools of Military Aeronautics.

Commandant (Graded as a Depot Commander).—Capt. (Temp. Maj.) J. W. Cruikshank, Durh. L.I., S.R., a Park Comdr., and to be Temp. Lieut.-Col. while so employed ; Aug. 31st, 1917.

*London Gazette Supplement, September 21st.*

Flying Officer (Observer).—Temp. Sec. Lieut. (on prob.) J. F. Gibson, Gen. List, and to be confirmed in his rank ; February 1st, sen. from October 24th, 1917.

Gen. List.—Corpl. W. J. Lee-Bird, from R.E., T.F., to be Temp. Sec. Lieut. (March 16th) (substituted for notification in *Gazette*, July 5th).

*London Gazette Supplement, September 24th.*

Equipment Officer, 3rd Class.—The rank of Lieut. H. J. Crabtree, Saskatchewan R., C.E.F., is as now described, and not as in *Gazette* Aug. 9th.

General List.—H. P. Valintine, late Capt., S. Afr. Inf., to be Temp. Capt. Nov. 27th, 1917.



Getting Ready to Start.—Hanging the "eggs" underneath the body of a German bomber.



# AIRCRAFT WORK AT THE FRONT.

## OFFICIAL INFORMATION.

### British.

"Operations by Royal Air Force contingents working with the Navy during the period September 1st to 7th have been considerably hampered by unsuitable weather conditions. Submarine shelters and workshops at Bruges docks have been attacked on four occasions, direct hits being obtained. Ostend docks and the coastal motor boat depot at Blankenberghe were also attacked with good results, and a large fire was started. Enemy mine-sweepers were also harassed with bombs and machine-gun fire. Over 14 tons of bombs were dropped by day bombing squadrons, one machine failing to return. In engagements with hostile aircraft, 10 machines have been brought down and nine driven down out of control. Three of our machines are missing. In home waters anti-submarine and convoy patrols have been maintained. Submarines have been sighted and attacked, and enemy mines located and destroyed."

*Admiralty, September 10th.*

"On September 9th low clouds and rain-squalls made the weather most unsuitable for flying. Our artillery machines persisted in their work whenever an opportunity offered. There is nothing else of interest to report. Flying was impossible at night."

*General Headquarters, September 10th.*

"Owing to continued heavy rain storms on September 10th, aerial observation was very difficult. In spite of a very high wind some work was accomplished during the fine intervals which occurred from time to time. Several reconnaissances were carried out by our machines and some photographs taken. One of our aeroplanes failed to return."

*General Headquarters, September 11th.*

"Frequent rain storms and high wind severely limited flying operations on September 11th, and there is nothing of interest to report."

*Headquarters R.A.F., Independent Force, September 12th.*

"In spite of strong wind several attempts were made to bomb targets along this front. Bombs were dropped on the railway at Courcelles, and direct hits were obtained on the track. The village of Verny and the railway west of it were also bombed with good results."

*Headquarters R.A.F., Independent Force, September 13th.*

"Night of the 12th-13th inst.—In conjunction with the attack of the American First Army, the railways at Metz-Sablon and Courcelles were heavily bombed by us with good results. Metz station, searchlights, and transport were attacked with machine-gun fire. On the 13th inst., in favourable weather, operations were continued against Metz-Sablon, other railway junctions, and enemy transport on the battle front. Nearly 7½ tons of bombs were dropped and good results were observed. One hostile machine was destroyed. Two of our machines are missing."

*General Headquarters, September 13th.*

"On September 12th strong wind, low clouds, and heavy rain prevailed throughout most of the day. Enemy aircraft was not active. Our own machines engaged on contact patrol and artillery observation work had to contend with most unfavourable weather conditions and could only fly at a low altitude. During brighter intervals some photographs were taken and several reconnaissances were successfully carried out. One of our machines is missing. At night no flying was possible."

*Headquarters R.A.F., Independent Force, September 14th.*

"In conjunction with the attack by the American First Army, the following were carried out:—On the 13th inst., in addition to the bombing reported in yesterday's communiqué, nearly a ton of bombs were dropped on the railways at Arncliffe and Metz-Sablon. Two enemy aircraft were shot down out of control. On the night of the 13th-14th, attacks were carried out on the railway at Courcelles, but, owing to the weather, results were difficult to observe. To-day the railways at Metz Sablon and Ehrang and Bühl aerodrome were attacked with good results. Three direct hits were obtained on the railway at Ehrang and on a shed at Bühl aerodrome. Nearly 6½ tons of bombs were dropped during the day and night. One of our machines is missing."

*General Headquarters, September 14th.*

"On September 13th clouds and rain again much interfered with operations in the air. During brighter intervals a number of photographs were taken, and our machines observed wherever possible for artillery fire. Contact patrol work had to be carried on at a very low altitude. One enemy machine was brought down in air fighting during the day and two were driven down out of control. At night two hostile night-bombing machines were brought down. Ten tons of bombs were dropped by us in the course of 24 hours. All our machines employed during this period have returned."

*General Headquarters, September 14th.*

"During the evening of yesterday strong hostile forces, assisted by a squadron of low-flying German aeroplanes, attacked our new positions at Havrincourt, and were repulsed with great loss."

*Headquarters R.A.F., Independent Force, September 15th.*

"On the battlefield, in addition to the bombing reported in yesterday's communiqué, the following bombing was carried out:—Two further attacks were made on Metz-Sablon in the late afternoon, and many direct hits were obtained on the railway triangle, on the workshops, the gasworks, and the barracks. Boulay aerodrome was also attacked with good results. On the night of the 14th-15th, heavy attacks were kept up throughout the night on Metz-Sablon, Courcelles, Ehrang, Saarbrücken, Kaiserslautern, and the aerodromes at Freycat and Boulay. Many direct hits were obtained on the railways, especially at Metz-Sablon and Courcelles, and several fires were caused at Metz, Kaiserslautern, Saarbrücken station, and Freycat aerodrome. Three of our machines failed to return. This morning the railway triangle at Metz-Sablon was again attacked, and many direct hits were obtained. Enemy scouts were active. Bombs were also dropped on Bühl aerodrome. Three of our machines are missing. To-day, the Daimler works at Stuttgart were also attacked with good results. During this raid 20 enemy aircraft were encountered and two destroyed. Our machines all returned safely. The total weight of bombs dropped during the 24 hours was over 27 tons."

*General Headquarters, September 15th.*

"On September 14th enemy aircraft showed more activity on some parts of the British front than for several days past. In air fighting, four hostile machines were destroyed. In addition, two enemy two-seaters were burnt on the ground in the course of a successful attack carried out by our airmen from a very low height upon an aerodrome south of Lille. Four German balloons were shot down in flames. Two of our machines are missing. A good deal of photography and artillery observation work was accomplished, together with a number of contact patrols. The weight of bombs dropped by us during the 24 hours amounted to nearly eight tons."

*Headquarters R.A.F., Independent Force, September 16th.*

"On the battle front, on the night of the 15th-16th inst., four hostile aerodromes were heavily and repeatedly attacked by our machines with excellent results. Four fires were started, three hostile machines on the ground were wrecked, two hangars were completely demolished, and several more hangars received direct hits. A transport convoy was hit four times. The railways at Metz-Sablon were again bombed and a fire started. The railway junctions at

Mainz and the docks and sidings at Karlsruhe were successfully attacked. Very good results were observed on both targets, and at Karlsruhe, where 3½ tons of bombs were dropped, 17 direct hits were obtained. During the night 350 bombs, totalling 16½ tons in weight, were dropped. All our machines returned."

*General Headquarters, September 16th.*

"On September 15th, with the improving weather, there was a marked increase of aerial activity. Enemy machines were encountered in large formations on the German side of the line, and there were many combats. Twenty-nine hostile aeroplanes were destroyed in air fighting during the day, and seven were driven down out of control. In addition, a large enemy night-bombing machine was brought down after dark. Sixteen of our machines are missing, including two night-flying aeroplanes. Four enemy aerodromes were successfully attacked and heavily bombed, one by day and three by night. During the 24 hours 30 tons of bombs were dropped by us. Our balloons took advantage of the clear atmosphere to send down many useful observations, and our aeroplanes engaged in reconnaissance, photography, and observation for artillery fire carried out much valuable work."

*Headquarters R.A.F., Independent Force, September 17th.*

"On the afternoon of the 16th our squadrons made two separate attacks on the aeroplane works and chemical factory at Mannheim with excellent results. The enemy attacked our machines over the objective. Three of our machines are missing. A German home defence aerodrome at Hagenau was attacked by a squadron, and bursts were observed on and near hangars. One hangar was seen in flames. All our machines returned. On the night 16th-17th our machines attacked three hostile aerodromes with bombs and machine-gun fire. Good results were obtained. The railways at Metz-Sablon and Trèves were very heavily attacked, and three fires were started at Metz-Sablon. Bombs were dropped all round Trèves station. The station at Frankfurt was also heavily attacked, and bombs were dropped with good effect. The night at first was calm, but later high winds got up. At present, seven of our machines have not been located. Sixty tons of bombs have been dropped in the last three days."

*General Headquarters, September 17th.*

"There was great aerial activity all along the British front on September 16th and our machines were busily engaged in every department of their work. Photographic reconnaissances, both of forward and distant areas, were carried out with great completeness, in spite of strong opposition, and the number of aerial photographs taken exceeds any recorded total for one day. Observation of our artillery fire was successfully performed both by aeroplanes and balloons. Much damage was reported in hostile battery positions, and many fires and explosions were caused. Nearly 24 tons of bombs were dropped by day and 15 tons on the following night on aerodromes used by the enemy's night-flying aeroplanes and on railheads and dumps. Fighting was intense all along the front throughout the day, combats taking place a considerable distance east of the lines. Forty-five hostile machines were brought down by our airmen. Of these, seven were brought down in one fight by one of our squadrons. Twenty other German machines were driven down out of control. In addition, one hostile aeroplane was shot down by our anti-aircraft guns. One hostile balloon was destroyed. Sixteen of our machines are missing."

*General Headquarters, September 18th.*

"After their heavy losses on the previous day, enemy aircraft were less active on September 17th. The weather on the British front was fine, with a strong wind. Our machines were at work all day, carrying out reconnaissance and photography far beyond the German line, observing and reporting the effect of our artillery fire, and bombing enemy aerodromes, dumps, and other selected targets. Eleven hostile machines were destroyed, and five others driven down out of control. Ten of our machines are missing. At night we heavily bombed three German aerodromes, where squadrons working in the battle area are located. Three large hostile night-bombing machines which came over our lines were detected by our searchlights, and attacked from the air and brought down. One of our night-flying aeroplanes is missing. The total weight of bombs dropped by us during the 24 hours is 29½ tons."

*Admiralty, September 18th.*

"During the last 48 hours Royal Air Force contingents working with the Navy dropped 13 tons of bombs on Bruges docks and Maria Alter aerodrome. Eleven enemy machines and a kite balloon were destroyed and seven driven down out of control. Four of our machines are missing. A formation of five enemy seaplanes approaching the East Coast was met and engaged by two seaplanes and two aeroplanes. One enemy machine was destroyed, the remainder retiring eastward. Generally unfavourable weather during the period September 8th-15th has restricted operations by Royal Air Force contingents working with the Navy. Several successful raids have been undertaken when the conditions permitted and over 9½ tons of bombs have been dropped on Bruges docks and enemy aerodromes with good results. Eleven bombs were observed to burst on the quays at Bruges, where a fire was started, and hostile destroyers were attacked off Zeebrugge Mole. Uytkerke aerodrome was attacked from a low altitude. One hangar was seen to burst into flames, a hut was demolished, and fires were started among workshops. The activity of enemy aircraft has been below normal, three hostile machines being destroyed and two driven down out of control. Two of our machines have failed to return, but are believed to have landed in a neutral country. Anti-submarine and convoy patrols have been maintained in Home waters, submarines being sighted and attacked and enemy mines located and destroyed."

*General Headquarters, September 19th.*

"Enemy aircraft activity was slight on September 18th. Four hostile machines were brought down, and three more driven down out of control. Four of our machines are missing. Our aeroplanes kept in touch with our advancing troops, and assisted the attack by bombing and machine-gun fire, as well as by reporting many targets to our artillery. During the 24 hours we dropped 16 tons of bombs. On September 16th a hostile aeroplane was brought down by one of our anti-aircraft batteries, and on the night of the 17th another enemy machine was shot down by machine-gun fire from the ground. These two German machines are in addition to those already announced as destroyed on the above dates."

*War Office, September 20th.*

"Salonica.—Four of our scouts, engaging 14 enemy machines, crashed two of them. One of our machines is missing."

*General Headquarters, September 20th.*

"Clouds and strong wind interfered with work in the air on September 19th, and artillery observation was carried on with difficulty. Our squadrons working on the Third and Fourth Army fronts kept in close touch with our troops, reported the positions of enemy batteries, and delivered ammunition to our machine gunners in the forward area. Five and a half tons of bombs were dropped by us on various targets. Two hostile aeroplanes were brought down in air fighting, and one was driven down out of control. Another hostile machine was shot down on the evening of the 18th inst. by anti-aircraft fire. None of our machines is missing. No flying was possible at night."

*Headquarters R.A.F., Independent Force, September 21st.*

"During the night of September 20th-21st we dropped 17 tons of bombs on various objectives. The Lanz works at Mannheim and the wharves and factories west of Karlsruhe were attacked with success. At Karlsruhe a large



fire broke out, and good bursts were observed at Mannheim. Blast furnaces at the Burbach works were bombed. Attacks were also made on the aerodromes at Boulay, Frescaty, and Morhange. Many direct hits were observed on hangars, and fires broke out at Frescaty and Morhange. One hostile machine was shot down. One of our machines has not returned."

#### General Headquarters, September 21st.

"On September 20th, in spite of low clouds and frequent showers, our aeroplanes carried out useful work in all departments of their activity. Sixteen enemy machines were destroyed in air fighting and three driven down out of control. Eleven of ours are missing. At night a German two-engined bombing machine was encountered and shot down. All our night-flying aeroplanes returned safely. Twenty-six and a half tons of bombs were dropped during the 24 hours. During the last three days our anti-aircraft fire has brought down two hostile machines, in addition to those already announced."

#### General Headquarters, September 22nd.

"Cloudy and windy weather continued to prevail on the British front on September 21st. In spite of these conditions, flying operations, including a number of reconnaissances and photographic flights, as well as many artillery patrols, were carried on without intermission by our squadrons. Seven enemy machines were destroyed during the day and three others driven down out of control. Eight of our machines are missing. During the night of September 21st-22nd three enemy bombing machines, which had been detected by our searchlights were engaged from the air and brought down. All our own night-flying aeroplanes returned safely. The weight of bombs dropped during these 24 hours amounted to 16 tons."

#### War Office, September 22nd.

**Italian Front.**—"Since my last report 15 enemy aircraft have been destroyed without loss to ourselves. There is nothing else of interest to report."

**Palestine.**—"Several days must elapse before accurate figures of captures can be given, but already . . . four aeroplanes . . . have been counted."

"Very severe losses have been inflicted on the masses of Turkish troops, retreating by difficult roads, by our air services."

"A German aeroplane, later ascertained to have been carrying mails, landed in the midst of our troops at El Afuleh, the pilot, who believed the place still to be in Turkish hands, destroying machine and contents before he could be secured."

#### Headquarters R.A.F., Independent Force, September 22nd.

"Total weight of bombs dropped on the night of the 20th-21st inst. was 22½ tons, and not 17 tons, as previously reported. On the night of the 21st-22nd four hostile aerodromes were attacked with bombs and machine-gun fire. The blast furnaces at Hagendingen and Rombach were attacked and hit. Total weight of bombs dropped, 15½ tons. All our machines returned."

#### War Office, September 23rd.

**Salonica.**—"As a result of the attacks and continual heavy pressure by the British and Greek troops, in conjunction with the French and Serbian advance of farther west, the enemy has evacuated his whole line from Doiran to west of the Vardar. He has set on fire Hudova Station, Tchestovo, and Tike and Tatarli dumps, and his troops and transport are crowding along the road northwards, heavily bombed and machine-gunned by our R.A.F."

#### Admiralty, September 23rd.

"During the period September 17th-21st, Royal Air Force contingents working with the Navy have been unable to carry out night operations, owing to unfavourable weather. Several day-bombing raids have taken place, and Bruges docks have been attacked on four occasions, 8 tons of bombs being dropped. Five hostile aerodromes were also bombed, with excellent results, subsequently confirmed by photographic reconnaissance. In engagements with enemy aircraft, six enemy machines have been destroyed and five driven down out of control. Three of our machines are missing. A hostile balloon was also shot down, and, falling in flames on the balloon camp, set fire to three hangars, all of which were burnt out. Information has been received that Constantinople was bombed on the nights of September 20th and 21st. Bombs burst on Haidar Pasha Station, buildings north of the Admiralty, and in Stambul. A seaplane hangar at Nagara is also believed to have been damaged. The operations were carried out in co-operation with Greek naval aircraft, and many thousands of propaganda leaflets were dropped in Stambul. One Greek and one British machine failed to return."

#### General Headquarters, September 23rd.

"The work of the Air Force was carried on throughout September 22nd in overcast and showery weather, but a good deal of artillery observation was accomplished, as well as a number of useful reconnaissances. Our bombing machines dropped 11 tons during the day. Eight enemy aeroplanes were destroyed; four of our own are missing. On the following night, in spite of very severe weather, one of our night-flying squadrons successfully attacked an enemy aerodrome near Valenciennes, dropping over 4 tons of bombs and returning without loss."

#### French.

#### Paris, September 10th.

"During the month of August our day-bombers dropped over 269 tons of projectiles on objectives on the battlefield between the Somme and the Aisne. Our night-bombers, attacking the railway stations and enemy ways of communication, dropped 262 tons of projectiles. During the same month, 280 enemy aeroplanes were brought down or fell in a damaged condition, including 29 accounted for by anti-aircraft guns. Sixty-six enemy captive balloons were set on fire."

"Balkans.—British airmen bombarded some enemy camps."

#### Paris, September 12th.

"Balkans.—French and British airmen dropped 400 kilogrammes of explosives in the region of Demirkau, Gradsko and Seres."

#### Paris, September 13th.

"Balkans.—British aeroplanes have bombed hostile encampments in the valley of the Struma."

#### Paris, September 14th.

"During September 12th and 13th our airmen took an active part in the offensive actions of the American Army. In spite of a violent wind, low clouds, and rain, our bombing and chasing machines attacked troops and convoys in the region of Conflans, Chambley, Vigneulles, Hattonchâtel and Mars-la-Tours. Seven enemy machines were brought down or put out of action, and one captive balloon was brought down in flames. In addition, our observation aeroplanes did not cease, in spite of all difficulties, in their task of informing the Command as to the situation on the battlefield and as to the progress of our troops supporting the American units."

#### Paris, September 15th.

"On Saturday, in conjunction with the American Army and on our own front, 14 enemy aeroplanes were brought down or driven down out of control and seven balloons were set on fire. Six and a half tons of bombs were dropped during the day on enemy assemblies. During the night our bombing squadrons dropped more than 23 tons of projectiles on the stations of Laon, Mortiers, Juniville, Conflans, Mars-la-Tour, &c."

#### Paris, September 16th.

"During September 15th our Air Service, favoured by the fine weather, was extremely active. Our airmen, directing their efforts to impeding the enemy's observation work, obtained remarkable results. In spite of the powerful protective measures undertaken in order to defend observation balloons, 16 captive

balloons were brought down in flames. In addition numerous air fights took place, in the course of which 12 German machines were brought down."

"Our bombarding air service during the night of September 14th-16th made expeditions against the lines of communication, the stations, and cantonments behind the enemy's front. The railway stations at Laon, Amagne, Marle, Longuyon, Doumary, Baroncourt, and Conflans were freely bombed and suffered important damage. Fires and explosions were observed, especially at Marle and Longuyon. A total of 46 tons of bombs was dropped."

"Balkans.—Serbian and French airmen took part in the operations (in the Dobropolje district), effectively supporting the advance of the infantry and bombing the enemy's communications."

#### Paris, September 17th.

"During September 16th six enemy machines were brought down or driven down out of control, and one captive balloon was brought down in flames. Our night bombing service carried on its work despite the tempest and rain which were raging. More than 10 tons of bombs were dropped on hostile railway stations, bivouacs, and aerodromes. Several fires were observed."

"Balkans.—To the west of the Sokol Serbian divisions carried the fortified zone between the Gradeshnitsa and the Sokol and crossed the river Gradeshnitsa, throwing back in disorder on the Razimby bridge the enemy units, who were caught under machine-gun fire by Allied aeroplanes."

#### Paris, September 18th.

"On the 14th inst. Sub-Lieut. Coiffard set fire to two enemy captive balloons and three more on the 15th. This brings up to 30 his total of aircraft brought down."

"Balkans.—The Allied air services completely dominate the enemy air forces, exerting themselves without stint, and are taking a most active part in the battle in close co-operation with the attacking troops."

#### Paris, September 21st.

"During Friday the activity of our air service was slight, owing to the unfavourable weather. It cleared up during the night, when our bombarding airmen dropped nearly 18 tons of bombs on enemy aerodromes, particularly on the night bombarding squadrons and on the junctions of important railway lines. Particularly successful results were observed, notably on the aerodromes of Stenay and Marville, where fires broke out, and on the railway stations of Etain, Buzancourt, and Jainville, where fires and explosions were noted. Sub-Lieut. Ambrogio brought down in flames on September 15th and 16th two captive balloons, which brings to 11 the number of aircraft brought down by this pilot."

"Balkans.—Our airmen unweariedly bombed and turned their machine guns on the retreating Bulgarian columns."

#### Paris, September 22nd.

"Balkans.—Our airmen continue to harass the retreating columns."

#### U.S.A.

#### Paris, September 18th.

"Aside from artillery activity in Lorraine and in Alsace, there is nothing of importance to report from the sectors occupied by our troops."

"In the course of a bombing operation in Lorraine, our airmen were attacked by superior forces. Five of our machines are missing."

#### Paris, September 23rd.

"Sub-Lieut. Herisson brought down two aeroplanes on September 18th, making the 10th and 11th victories of this pilot."

#### Italian.

#### Rome, September 12th.

"Three hostile machines were brought down in air combats."

#### Rome, September 15th.

"Yesterday, bombing and reconnoitring flights and airships of the Army and of the Royal Navy bombarded successfully enemy aerodromes in the region of the Upper Adige and the establishments and military works of Pola. Five hostile machines were brought down in air combats."

#### Rome, September 16th.

"Army and Navy airships dropped nearly 15 tons of bombs on various military targets along the enemy lines of communication. One hostile machine was brought down in air combats."

#### Rome, September 18th.

"In various aerial bombardment actions, aviation camps and military establishments in Sugana Valley and between the Piave and Tagliamento were effectively bombed. Two enemy aeroplanes were brought down in combats."

#### Rome, September 19th.

"Three hostile aeroplanes were brought down and a fourth machine forced to land."

#### Rome, September 20th.

"One of our flights bombarded with over a ton of bombs the arsenal of Pola, the dockyards and depôts of the Ulivi Reef, obtaining effective results. Two hostile machines were brought down and three others were driven down out of control."

#### Rome, September 21st.

"One hostile aeroplane was brought down in air fighting."

#### Belgian.

#### Havre, September 17th.

"One of our pilots brought down an enemy balloon in flames on Monday."

#### Havre, September 23rd.

"In the course of the night of September 21st-22nd several of our encampments were bombed by enemy aeroplanes."

#### Serbian.

#### Corfu, September 16th.

"French and Serbian airmen have given proof of extraordinary activity and great bravery."

#### Corfu, September 20th.

"Airmen do not cease bombarding and fire from their machine guns the enemy's retreating troops."

#### German.

#### Berlin, September 16th.

"We shot down four enemy aeroplanes and 15 captive balloons."

#### Berlin, September 17th.

"Yesterday we shot down 44 enemy aeroplanes. Col. Lörzer achieved his 40th, Lieut. Rumeys his 35th, and Lieut. Thuy his 30th aerial victory."

#### Berlin, September 20th.

"Over the battlefield between the Meuse and the Moselle Chaser-Squadron No. 2, under the command of 1st Lieut. Baron von Boenigk, from September 12th to 18th, shot down 81 enemy aeroplanes. It lost, for its part, only two aeroplanes in combat. Lieut. Buechner achieved his 30th aerial victory."

#### Berlin, September 23rd.

"1st Lieut. Lörzer obtained his 42nd aerial victory, and Lieut. Baumer his 30th."

#### Austrian.

#### Vienna, September 13th.

"Squadron-leader Groslovic to-day brought down three enemy aeroplanes over Durazzo."

#### Bulgarian.

#### Sofia, September 10th.

"Between the Vardar and Lake Doiran a German airman, Sub-Lieut. Tide, brought down two hostile aeroplanes, which fell in front of our trenches, thus achieving his seventh and eighth aerial victories."

#### Sofia, September 20th.

"East of the Toherna the German Lance-Sergt. Feseler obtained his 17th aerial victory."



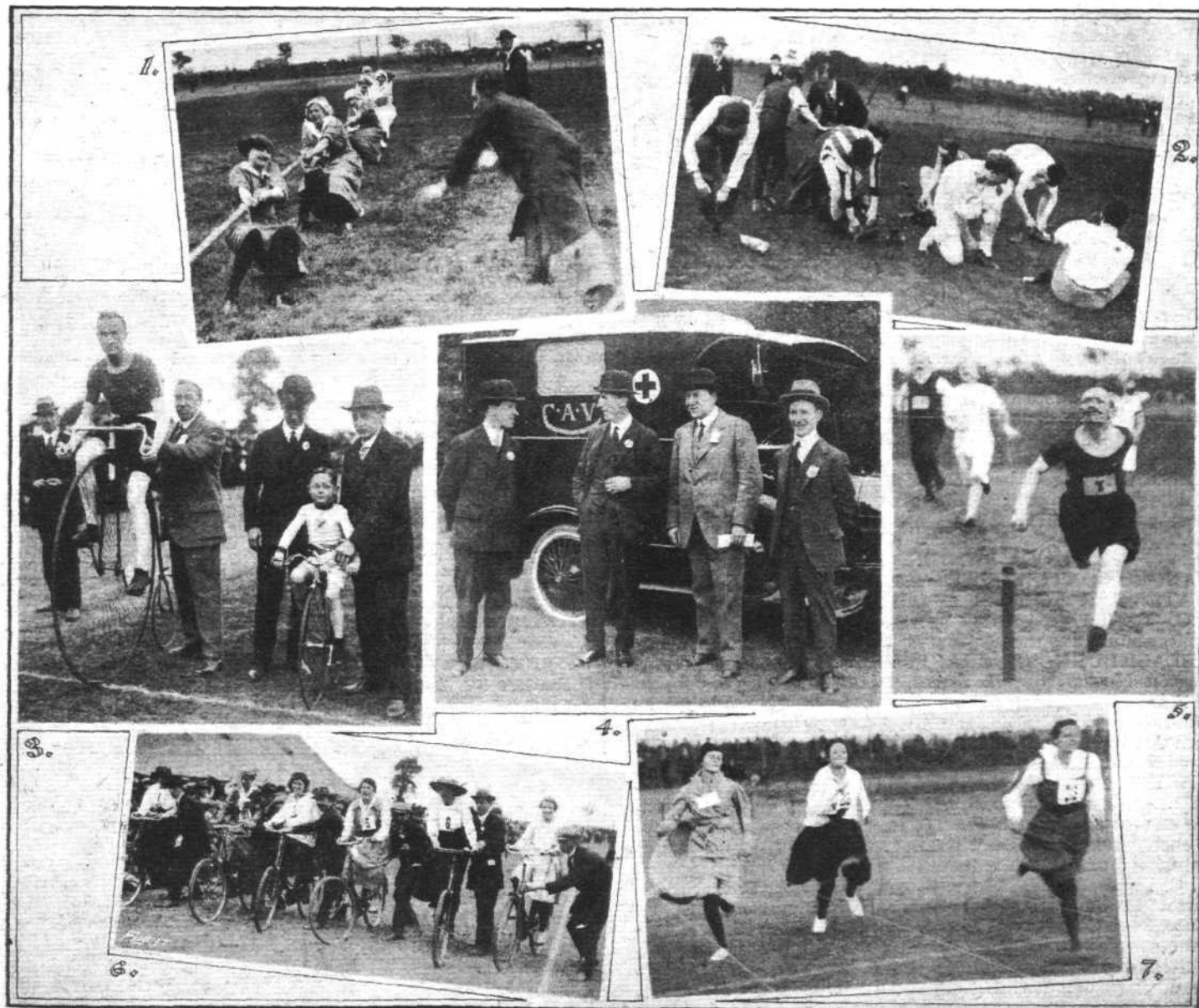
## LEISURE HOURS.

THERE was a big muster at the second annual sports meeting of the Davidson Aviation Company held at the Fulham Football Ground (by the kind permission of Mr. Kelso) on Saturday, September 14th, and so lengthy was the programme that the last item was not reached until 9 o'clock. Mrs. Chester, wife of Mr. W. Ewart Chester, the Managing Director, presented the prizes, and throughout the afternoon the proceedings were enlivened by the band of the Metropolitan Police. All the events were keenly contested, and some close finishes were witnessed. In the one-mile open race Mr. B. Waghorn proved to be the winner, and he also won the 100 yards event. The five-mile Marathon was won by Mr. F. Braham. There was a tug-of-war between teams representing the directors and the staff and the former won. Among the other interesting items was a beauty competition, won by Miss Clarke.

ON Saturday last a highly successful entertainment was given by the Falcon Aircrew Co. at St. John's Institute, Holloway Road, to over a hundred wounded Tommies from various hospitals. Among the items on the extensive programme were a series of boxing contests and exhibitions, which were keenly appreciated by the boys in blue. A very fine exhibition bout was given by Sergt.-Instr. Pat. O'Keefe, middle-weight champion, and Corpl. Morgan, M.G.C. There was an interval for tea, at the conclusion of which Mr. Davies, managing director of the Falcon Aircrew Co., paid his employ-

ees a graceful compliment, greeted with applause, by pointing out that in spite of the fact that the employees had contributed their share towards providing the entertainment, they stuck to their benches all the afternoon, although undoubtedly very many of them would have greatly enjoyed the boxing contests and exhibitions. The lighter part of the programme was then commenced upon by Mr. J. W. Bewsher, who caused great amusement with a series of impersonations, imitations and juggling. A selection of songs and other entertainments, many by employees of the Falcon Aircrew Co., who had by this time come off duty, brought a highly successful afternoon to an end.

THE employees of Messrs. C. A. Vandervell and Co. spent a pleasant afternoon last Saturday at the sports meeting arranged by their own athletic association. There were many interesting items on the programme, and certainly not the least exciting was the race on high "ordinaries" between H. W. Bartleet of the Anerley B.C. and "an unknown," who was later identified as Master Teddie Jarvis, aged 5. Bartleet had to ride two laps whilst his youthful antagonist rode one, and he just missed winning by an inch or so. One of our photographs shows the start of the event. The meeting had been arranged in aid of the War Seal Foundation for Disabled Soldiers, and it is hoped that a substantial sum will be handed over.



THE C.A.V. SPORTS.—1. Tug-o'-War.—The machine shop A team. 2. Boot and Shoe Race. 3. "Ordinary" Bicycle Race. H. W. Bartleet v. an unknown (Master Teddie Jarvis, ætat 5). Mr. F. Goodwin acts as "sponge-holder" to the veteran. 4. Prominent members of the C.A.V. firm: (left to right) Messrs. Midgley, Steel, F. Goodwin, and Atkinson. 5. Veterans' Race. 6. 880 Yards Ladies' Cycle Race. 7. 100 Yards Girls' Race.



## SIDE-WINDS.

It was decided some time ago by the Council of the S.M.M.T. to present their former President, Mr. E. Powell, with a souvenir from the Society of his term of office, and the presentation took place at the Royal Automobile Club at a luncheon on September 19th. In making the presentation the new President, Mr. A. Brown, referred to the difficult circumstances which Mr. Powell had had to face so soon after his election in June, 1914, when the Society had attained to a position probably without parallel among trade organisations. During his long period of office the position of President had been one of exceptional difficulty, entailing a great amount of personal attention to intricate matters arising out of war legislation. There had been, too, the misfortune of the non-acceptance by the Government of the Society's offer of service early in the war. The members of the Council were in a position to appreciate all this, and it gave them great pleasure to see Mr. Powell amongst them again after the illness which had necessitated his vacating the chair. In his reply, Mr. Powell laid emphasis upon the necessity for unity in the trade. The fact that a number of new societies had been formed did not by any means detract from the usefulness of the S.M.M.T. Problems had now to be faced which more than ever demanded a united front. He appealed for support from all quarters in the broadest spirit to the central body, which had before it a sphere of useful activity as great as anything in the past. Mr. E. Manville proposed the toast of the Chairman, and expressed the pleasure which had been felt throughout the industry in the selection of such a prominent representative of the allied industries as Mr. Albert Brown.

FROM solid experience no lead pencil could be better than the Venus. It is ever soothing to write with, and as for drawing—well the draughtsman will find something to suit him every time. By way of showing what can be done with Venus pencils, the American Lead Pencil Co., of 173, Lower Clapton Road, London, N.E., have issued a little booklet in which are reproduced various engineering drawings and the pencils used are indicated. They will be pleased to send a copy of the booklet, which illustrates the seventeen degrees of hardness of Venus pencil, to any draughtsman who applies for it. The firm also produce a copying pencil which is so different to other copying pencils because it is so much better.

WHAT with the depletion of staffs and increase of business there are many who are carrying on who have to turn every moment of the day to the best account. Every second saved has its value, and in this connection we are reminded of the Lazilite telephone attachment made by the Lazilite Co., of 5, Baldwin's Gardens, Gray's Inn Road, London, E.C. It keeps the telephone clear of the desk, and yet a touch is all that is required to bring it into position, and when it is finished with it goes back out of the way until it is required again. The firm will gladly give their advice to anyone considering the question of telephone installations.

### NEW COMPANIES REGISTERED.

ANGLO-CONTINENTAL CAIRO AND EASTERN STATES AIR ROUTES, LTD., 29a, Charing Cross Road, W.C.—Capital £100, in £1 shares. Objects and other particulars similar to those of the Eastern Aerial Service, Ltd.

BLACKBURN AIRCRAFT PRODUCTS, LTD., Donnington House, Norfolk Street, W.C.—Capital £10,000, in £1 shares. Acquiring certain patent rights and trade marks and the goodwill in connection therewith from the Blackburn Aeroplane and Motor Co., Ltd. First-directors: R. R. Rhodes and B. A. Waller.

BRITISH GAUGE MANUFACTURERS' ASSOCIATION, LTD., 44, Caxton House, S.W. 1.—Limited by guarantee with 100 members, each liable for £5 in the event of winding up, to encourage, protect and promote the British gauge manufacturing industry. The first members of the Committee are: W. C. Pitter, Upper Market Street, Woolwich, S.E.; W. J. Bassett-Lowke, Kingswell Street, Northampton; S. H. Jones, 84-6, Commercial Street, Newport, Mon.; S. A. Hartsmann, James Street West, Bath.; A. L. Railthorpe, 115, Whitehorse Road, Croydon; P. A. Bartley, 140, Queen's Road, Clarendon Park, Leicester; L. H. Hounsfeld, Trojan, Ltd., Vicarage Road, Croydon.

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### PUBLICATIONS RECEIVED.

Plane Talks from the Skies. By "Wing Adjutant." London: Cassell and Co., Ltd. Price 2s. 6d. net.

Airy Nothings. By Capt. H. Barber, R.A.F. London: McBride, Nast and Co., Ltd. Price 3s. 6d. net.

All the World's Aircraft, 1918. Edited by C. G. Grey. London: Sampson Low, Marston and Co., Ltd. Price 25s. net.

### Catalogue.

Aircraft Fittings of Quality. S. A. Lamplugh, Ltd., King's Road, Tyseley, Birmingham.

### Aeronautical Patents Published.

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